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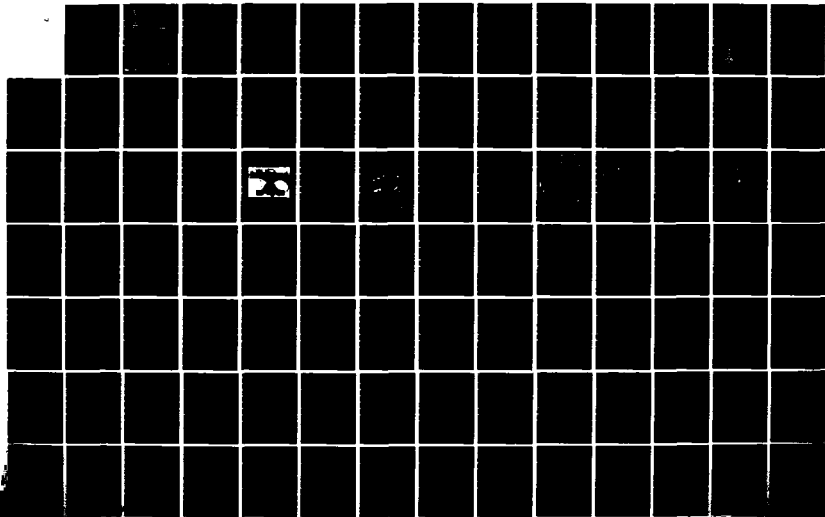
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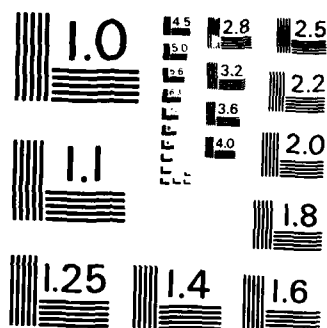
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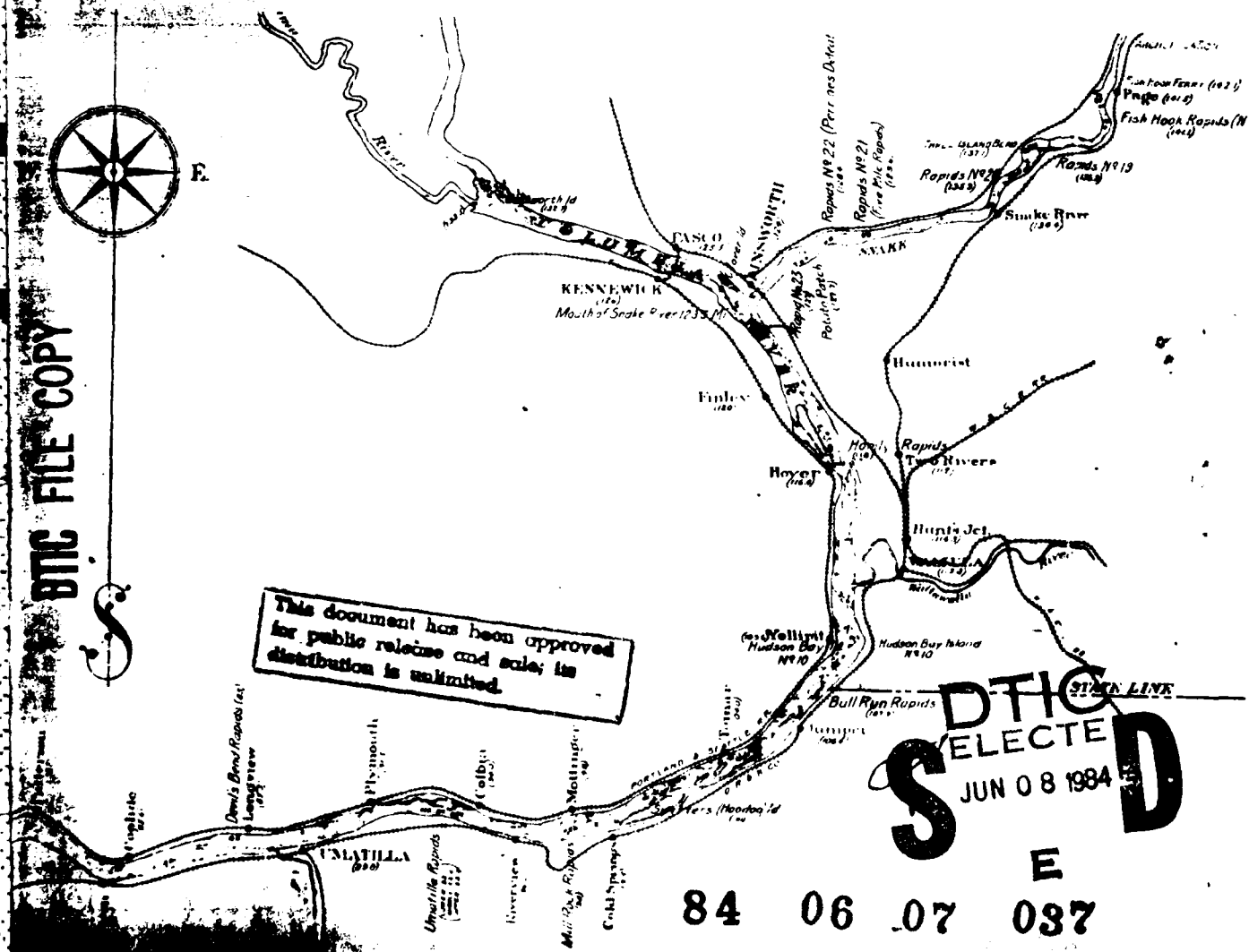


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of Engineers  
Waterways District

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# A Report of Archaeological Investigations At The Two Rivers Site (45BN14),

At The Confluence of  
The Snake And Columbia Rivers.



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The Two Rivers testing project indicated three distinct cultural areas. Time and funding allowed for subsurface testing in only one of the three areas. Results of the excavation indicated two cultural components; an upper Late Prehistoric occupation and a lower early Cascade subphase component underlying a layer of Mazama Ash (ca. 6700 B.P.).

29 March 1984

A REPORT OF  
ARCHAEOLOGICAL INVESTIGATIONS  
AT THE TWO RIVERS SITE (45BN14),  
AT THE CONFLUENCE OF  
THE SNAKE AND COLUMBIA RIVERS

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As is usually the case in archaeological research, the success of our endeavours at the Two Rivers Site is directly attributable to several key individuals. Dr. Rick Pettigrew of the Museum of Natural History, University of Oregon, provided valuable advice on many aspects, ranging from selection of crew members to the regional archaeology of the Columbia Plateau and how to approach it. My crew members, Martin Reinbold of Oregon State University, and Robert Wenger of the University of Oregon, were two of the finest excavators and field archaeologists that I have ever worked with. Nick Paglieri of the Mid-Columbia Archaeological Society of Richland, Washington volunteered to work with us every step of the way, and his skill, devotion to archaeology, and unflagging enthusiasm was invaluable. LeRoy Allen and John Leier of the Walla Walla Corps of Engineers proved an efficient liason with their agency and made it possible to conduct the survey of Area B by providing us with a row boat. Joe Davis of Professional Analysts, Eugene, Oregon served as Project Manager, and saw to it that everything ran smoothly.

To all of the above individuals I extend my gratitude and appreciation.

## EXECUTIVE SUMMARY

Professional Analysts of Eugene, Oregon conducted cultural resource investigations and archaeological test excavations at the Two Rivers Site (45BN14) in August 1983. Activities included: (1) a thorough literature search for previous archaeological investigations in the site vicinity; (2) an intensive on-the-ground survey of the site area; and, (3) the excavation of eighty subsurface probes across the site boundaries during Phase I field operations. Phase I results included the following:

1. The east side of the site (Area A), held at least two components, one above and one below a layer of Mazama Ash;
2. There was a smaller component buried at least 50 cm below surface in the central part of the site (Area C); and,
3. Much of the site, known to local amateur archaeologists, was not reported in the literature and consisted of an eroded midden area (Area B), separated from areas A and C by the high dam pool.

The results of Phase I determined the nature of Phase II.

Based on the interpretation that site 45BN14 was a complex of several buried, stratified components of unknown antiquity, we proceeded to initiate Phase II while the crew was still in the field in order to minimize the cost to the project.

Phase II activities involved the hand excavation of two test units in Area A: Test Unit 1 (1 x 2 m), and Test Unit 2 (2 x 2 m). We excavated these units to a depth of 1.8 m, beyond which lay only culturally sterile strata. Geological and archaeological criteria divide Area A into two components: an

upper (20-40 cm below surface) Late Prehistoric occupation and a lower (1.3-1.7 m) early Cascade subphase component, which underlies a layer of Mazama Ash (ca. 6700 B.P.).

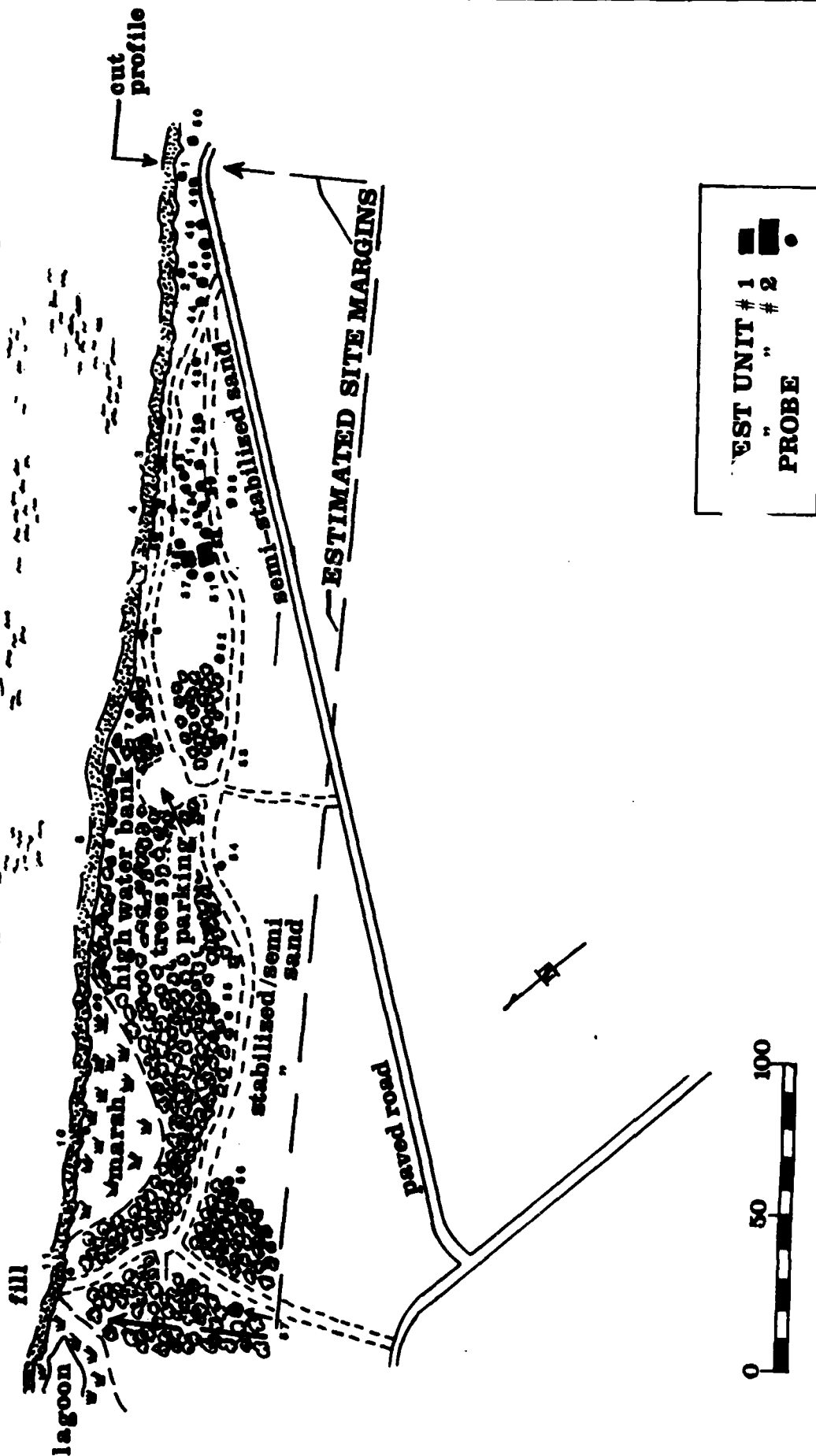
Professional Analysts believes that site 45BN14 is eligible for inclusion on the National Register of Historic Places (NRHP), even though we are not yet able to understand fully the site's archaeological, historical, or anthropological significance. Because of this serious short coming in our knowledge, we recommend that the U.S. Corps of Engineers sponsor further archaeological test excavations in all areas of the site.

Finally, Professional Analysts recommends that the Corps of Engineers close the east side of the site in the vicinities of Areas A and C to all vehicles: off the road vehicular traffic is causing severe damage to the Late Prehistoric component in these areas.

## PART 1 - INTRODUCTION

The U.S. Army Corps of Engineers has been evaluating archaeological sites in its land holdings for the past several years. In August of 1983, Professional Analysts of Eugene, Oregon was contracted to carry out a cultural resources investigation and evaluation of the Two Rivers Site (45BN14) for the purpose of determining the site's eligibility to the National Register of Historic Places. The Two Rivers Site lies on the southwestern bank of the Columbia River directly across from, and slightly south of its confluence with the Lower Snake River (Figures 1 and 2). At this writing, this location falls within the east, undeveloped, portions of Two Rivers County Park. The project had two phases, with the second phase contingent upon the results of the first. This report describes the results of field research conducted during these two phases; it also contains recommendations for both the management of areas of archaeological significance and future research.

# LAKE WALLULA



45EN14 **TWO RIVERS SITE** (AFTER BURTHARD 1981)

FIGURE 1

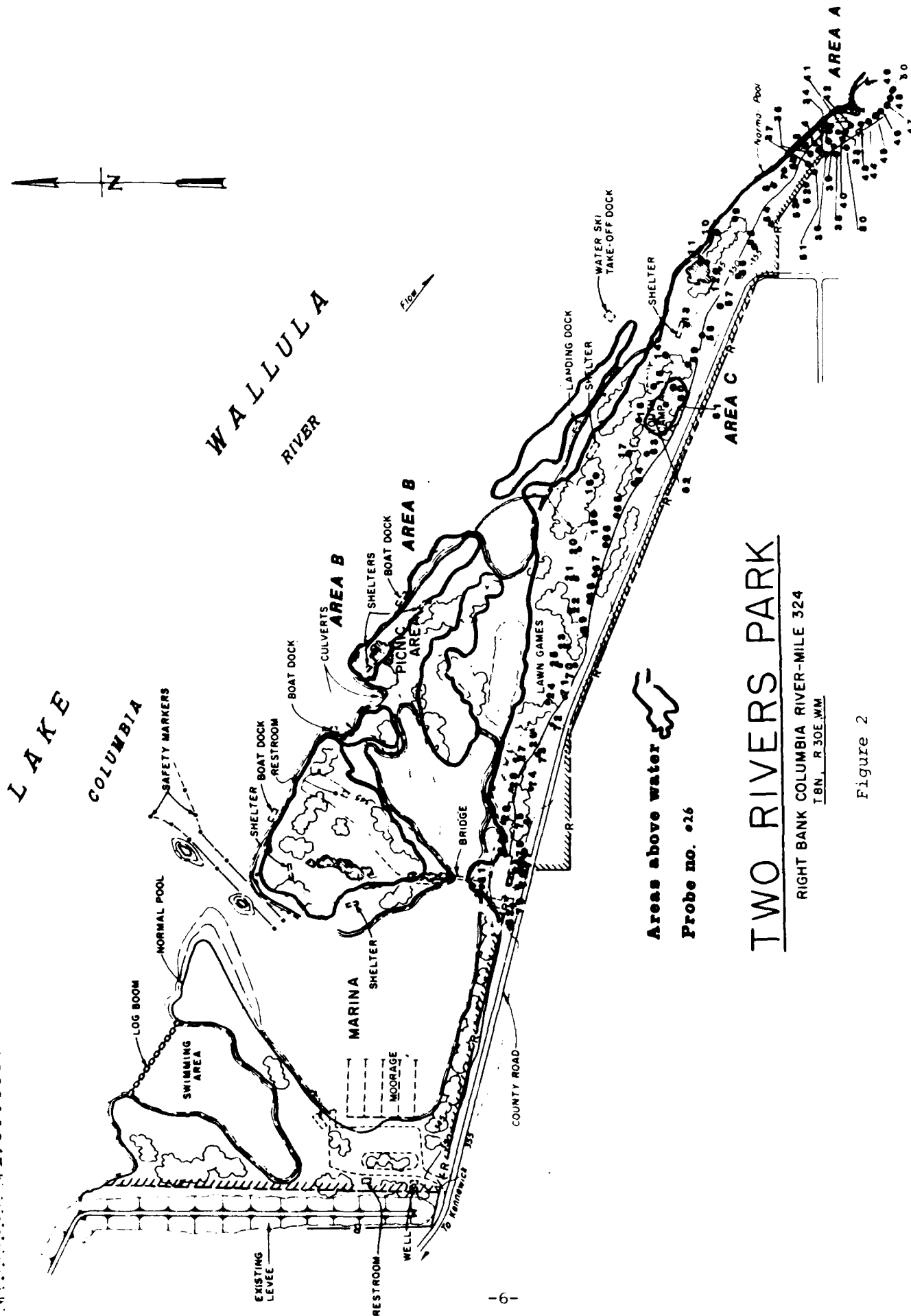


Figure 2

## PART 2 - ENVIRONMENTAL BACKGROUND

### 2.1 Physiography

The Two Rivers Site is located within the semi-arid Columbia Basin geological/environmental system. The Basin is approximately delimited by the Cascade Mountains on the west, the Okanogan Highlands on the north, the Idaho Rockies on the east and the Blue Mountains of Oregon to the southeast and south. Like Burtchard (1981:22), I have selected the term Columbia Basin: "to reflect the geological relationship of the region . . . with its surrounding mountainous margins. The region approximates the area variously referred to as the Columbia Plateau, Columbia Plains, and Inland Empire among others."

This region is further subdivided into sub-regional physiographic zones such as the channeled scablands, Palouse Hills, Yakima Folds, and in the study area, the Pasco Basin of the Central Plains section, an area of low relief, interspersed with longitudinal sand dunes, and a dendritic system of coulees (Chatters 1980:13).

### 2.2 Geologic History

The vertical beds of basalt observed throughout the Columbia Basin were formed during the Miocene and early Pliocene Epochs. Enormous fissures in the earth, in the vicinity of Pasco and Yakima unleashed millions of cubic miles of fluid lava, that covered an area of thousands of square miles to depths in excess of 8000 ft. These basalt flows created a nearly level plain that slowed river gradients and formed marshlands. A series of plant colonizations ensued during the mild, humid climate of the Early Pliocene (Chatters 1980:14).

During the Middle Pleistocene tectonic folding and faulting transformed the landscape. The Cascade Mountains and the low hills between the Yakima and Columbia Rivers began to take shape. During this period the earth's surface in the Pasco vicinity began to subside, due to a loss of magma in the earth's crust and the shear weight of over 8000 ft of basalt (Chatters 1980:13).

By the Late Pliocene the rising anticline of the Horse Heaven Hills to the south of the study area, dammed the Snake and Columbia Rivers. The containment of these immense rivers formed a large lake and alluvial plains. Laminated sands, silts, and clays deposited during the late Pliocene and Pleistocene, presently extend from Wallula Gap northward into the Quincy Basin and Moses Lake. Eventually the Ringold Formation evolved, a series of unconsolidated sedimentary rocks containing vertebrate fossils, especially in the uppermost beds (Strand and Hough 1952, Chatters 1980).

In the early Pleistocene, dry climatic intervals and extensive aeolian erosion and redeposition moved vast amounts of sands, clays, and silts from the southwest to the northeast throughout the Columbia Basin (Fryxell and Cook 1964). In order of size gradient, the larger sand particles were deposited first, followed by silts and then clays. The Palouse loess hills were formed during this time, and are still forming as prevailing winds have changed little since the Early Pleistocene (Fryxell and Cook 1964).

During the maximal glaciations of the Late Pleistocene the Columbia Basin was dramatically altered. Cordilleran ice sheets, originating in the Canadian Rockies, pushed into the Columbia River and its tributaries. Two ice dams were formed. One was located at the present Grand Coulee dam site



and diverted the Columbia south of its present channel. Another ice dam in Northern Idaho formed gigantic Lake Missoula. Repeatedly these ice dams broke open and released many cubic miles of water across Eastern Washington.

Ringold and Palous deposits were removed from the basaltic flows and many channels were stripped to bare bedrock. The scablands, coulees, and mesas of Eastern Washington were formed during this interval (Chatters 1980:16).

During the recent Holocene the geological structure of the study area has changed little. Winds continue to transport sediments east and northeast. In aeolian, alluvial, and colluvial contexts two volcanic ash lenses are often encountered. These ash deposits resulted from the eruptions of Glacier Peak at ca. 12,000 B.P. and Mount Mazama at 6700 B.P. (Fryxell 1965). Both layers are excellent archaeological horizon markers.

### 2.3 Climate

The relationship of the encircling mountains with the Columbia Basin is a primary climatic determinant. The Rocky Mountains protect the region from the severe arctic winds of continental interior Canada. The Cascade Mountains form an obstacle to the rain-laden marine weather systems of the Northeastern Pacific Ocean. As a result the climate is generally arid with moderate to hot summers and mild winters (Chatters 1980:18).

Precipitation is generally less than 7 in. per year. Most of this falls as rain in late fall and early summer. Snow falls from December through February (and occasionally into March). There is an irregular ground cover of 4-10 in. (Chatters 1980:19).

#### 2.4 Flora

The study area is part of the Eastern Washington steppes (Daubenmire 1970), and also falls within the Artemisia tridentata - Apropyron spicatum habitat type, which is dominated by big sagebrush (Artemisia tridentata), a perennial form of bunchgrass. Other species observed in the study area include three tooth sage (Artemisia tripartita), indian paintbrush (Castilleja spp.), lupin (Lupinus sericeus) and poa (Poa cusickii) (Daubenmire 1970).

#### 2.5 Fauna

Fauna common to the area include Whitetail deer. Washington ground squirrel (Spermophilus washingtoni), yellow bellied marmot (Marmota flaventris), blacktail jackrabbit (Lepus californicus), Nuttall's cottontail (Sylvilagus nuttali) and pygmy cottontail (S. idahoensis).

Waterfowl are seasonal visitors to the region including, Canada geese (Branta canadensis), mallard (Anas anas), ruddy duck (Oxyura jamaicensis), teal (Anas spp.), canvasback (Aythya valisineria) and many others.

Predators common to the region include long-tail weasel (Mustela longicaudus), coyote (Canis latrans), badger (Taxidea taxus), and bobcat (Lynx rufus).

The Columbia River is the habitat of diverse aquatic species including various seasonal migrations of salmon (Onchorhynchus spp.), steelhead (Salmo gairdneri) and lamprey (Entosphenus tridentatus). Various trout species (Salmo spp.), efish (Prosopium williamsoni), chubs (Mylocheilus caurinus), suckers, quawfish (Ptychocheilus oregonensis) are present year round.

Two species of large bivalve are present in rivers and creeks, Margaritifera falcata and Gonida angulata. Gonida is common in brackish, muddy waters while Margaritifera prefers swift moving water and gravel bottoms (Chatters 1980:24-25; Dalquest 1948).

## 2.6 Ethnography

Prior to Euroamerican contact the Columbia Basin was heavily populated. Lewis and Clark described numerous villages along the banks of the Columbia and Snake. Lewis estimated within thirty years after his initial contact with the native people of the Middle Columbia that smallpox may have decimated half of the population (Thwaites 1905). The ensuing demographic adjustments made by the aboriginal inhabitants to the impact of Euroamerican culture obscured many of the prior pristine sociocultural distinctions. These adjustments may have altered the nature of settlement and subsistence, sociopolitical structure and the distribution of linguistic groups (Teit 1928; Schister 1975; Chalfant 1974).

According to reconstructions made by twentieth century ethnographers the study area was primarily occupied by the Sahaptin-speaking Yakima (Ray 1936, 1939). Tribal groups of the region, however, were not organized into rigid, permanent political units. Villages were autonomous, and families changed membership in villages with some frequency. Resources of a region were open to group's outside of the local village, although in some cases negotiations with the local headman may have been required.

The two main villages of the Yakima along the Columbia were located across from Richland and at the present site of Pasco. The majority of this group lived along the Yakima River, and still reside there at the Yakima Reservation.

Though the distribution of groups at the time of Lewis and Clark is vague as a result of the processes described above it is possible that the poorly known Wallula visited the study area. Apparently they lived on both sides of Snake River and along the Columbia near Wallula Gap (Chatters 1980:39). Thus, they may have had access to the area at the confluence of the Columbia and Snake.

## PART 3 - METHODOLOGY

### 3.1 Literature Search Methods and Previous Archaeological Research

Prior to planning a detailed survey and testing program, we reviewed the published literature available as of 01 August 1983 for information on the prehistory, history, and environment of the study area. There is considerable material regarding the Middle Columbia and Lower Snake River systems, and we found the following reports to be of considerable use: Burtchard 1981; Cleveland et al. 1976; Schalk 1980; and, Thoms et al. 1983 especially for their background on recent regional archaeological research.

The earliest archaeological work in the study area, as well as in much of the Pacific Northwest, occurred in the 1940s in conjunction with the Smithsonian Institution's River Basin Surveys Program. The objective of these investigations was to locate and assess archaeological sites that would be destroyed or flooded as a result of dam and reservoir construction projects of the U.S. Army Corps of Engineers (see Drucker 1948; Osborne 1949; Osborne and Shiner 1950; Shiner 1951; Osborne and Shiner 1951; Osborne 1957; Shiner 1961; Osborne et al. 1961).

Other reports that helped frame our approach to the Two Rivers site included Nelson (1969), Pettigrew (1983), Dumond and Minor (1983), and Leonhardy and Rice (1970).

Our literature search reviewed the holdings and listings of many federal, state, and local agencies; in addition, we also interviewed professional and amateur archaeologists. The results of these activities suggested the following propositions concerning the Two Rivers Site (45BN14A):

1. There was little probability that cultural deposits at the site exceeded a depth of 2 m (Burtchard 1981);
2. Mazama ash may not have been preserved at the site due to colluvial and alluvial erosion;
3. The site could be one continuous scatter with little concentration or separation of deposits (Schalk 1980);
4. The site "implies a sedentary village complex" (Burtchard 1981:120); however, "much of the site's cultural remains are now gone" (ibid.);
5. The highest density of cultural debris apparently exists on the west side of the site (Burtchard 1981:121);
6. Neither Burtchard (1981) nor Cleveland et al. (1976) reported on the bulk of the site. Local archaeologists (Nick Paglieri, personal communication) maintained that most of the materials were concentrated north of the river bank on a hillock of land that the high dam pool had made into an artificial island (hereafter this area will carry the designation 45BN14B or Area B). Materials collected over the years by a local resident of Finley came entirely from this unreported site area. Materials I observed in this collection included: 2 large, grooved basalt cobble net sinkers; 1 large pestle; 1 pocked and abraded cobble of basalt, resembling an oil lamp; a few dozen pieces of deer, rabbit, and bird bone; several stemmed (side notched, concave based: Type 12 of Pettigrew 1981) projectile points; and, about 200 ccs flakes of every variety. In short, this individual had been collecting from an extensive midden deposit in Area B.

### 3.2 Field Reconnaissance Methods

Prior to subsurface probing, a three member survey crew conducted a pedestrian survey of the site, using the transect surveying method. The crew walked over most of the site (except Area B) in transects spaced at approximately 15 m intervals. The "mainland" side of the site gave up virtually no

prehistoric cultural debris on its west end and less than five flakes on its east end.

The Walla Walla Corps of Engineers office (notably LeRoy Allen and John Leier) provided a row boat that enabled the crew to survey Area B and make surface collections. The results of this field work demonstrated that, as suggested above, a large portion of the site is located in this area and a thick midden deposit is eroding from the present shore line. The survey crew sketch mapped and described the approximate limits of the unsubmerged portion of this site.

### 3.3 Subsurface Probing Methods

We adhered to the following methods in every phase of our field work, although special circumstances forced us to make occasional exceptions. These exceptions presented no great problem since our operating field strategy emphasized flexibility. Starting from the east corner of the site, we made a sufficient number (eighty in all) of shovel and auger tests to determine the presence or absence of cultural materials and the vertical and horizontal boundaries of the site.

Our sampling of trench soils proceeded according to the following nested design:

- . Primary Sample--we initially sampled the area at 50 m intervals, along an axis aligned approximately parallel to the existing riverbank. We examined all samples for macroscopic debris; samples lacking such evidence were checked for microdebitage using 1/8" mesh screens. We noted the presence or absence of macro- or microscopic remains with "hits" and "misses" on the site base map. If a sample showed the presence of cultural materials, we then moved to the following secondary sampling:

- . Secondary Sample--when primary samples indicated the presence of cultural remains, we conducted a second sampling stage in the immediate vicinity of all such first-stage "primary hits". This consisted of taking cores at a 20 to 25 m distance from each primary hit. Again, we examined the cores for macro- and microdetritus and transferred the results to appropriate maps and records. If the secondary sample yielded "hits", then we moved to a tertiary sample examination:
- . Tertiary Sample--if secondary core samples yielded "hits", we conducted a third sampling stage to further delimit site boundaries. These tertiary sample units were placed at a distance of 10 m: Figure 1 shows the resulting pattern.

We backfilled all shovel and auger holes immediately after documentation.

### 3.3.1 Subsurface Probing Results: Summary

The results of the subsurface probing of the Two River site yielded the following data (see also Appendix 1), which marked the end of Phase 1 investigations:

The east side of the site (Area A, see Figure 1) had at least two components, one above and one below a Mazama ash layer.

There was a smaller component buried at least 50 cm below surface in the central area (Area C).

Unexpectedly, we found virtually no prehistoric cultural materials in the west side of the site (cf. Burtchard 1981:121).

Furthermore, the stratigraphy was highly variable from east to west across the site (see Appendix 1), with the deepest fine grained river sands on the east side. These sands gradually gave way to coarser grained sandy silts from east to west; in addition, a thin plow zone of approximately the



upper 20 cm of the site was preserved on the east side. This layer became thicker to the west (sometimes exceeding 40 cm).

### 3.3.2 A Consideration of Biases Inherent in Subsurface Probing Methods

The greatest problem with shovel and auger testing is the difficulty in keeping vertical provenience control of recovered artifacts. This problem is particularly troublesome when there are two or more buried components, for, as a hole is excavated, contact with, and scraping of, the sidewalls is unavoidable; and the mixing of components is sometimes the result. This kind of subsurface probing, can at best give only an approximate estimate of what the buried components are like. An approximate understanding of a site as large as the Two Rivers site seems a better objective than limiting testing to 1 x 1 m units in a spatially restricted portion of the site, which would eliminate any knowledge of the remainder of the site.

In our particular situation, another bias was due to the limits of our shovels and auger, we were rarely able to excavate below a depth of 1.2 m; as this report demonstrates (see Appendix 1, and Stratigraphy Discussion), however, this was a sufficient probing depth for most of the site.

We used 1/8" screen throughout the bulk of subsurface probing and thus our results are biased towards recovery of items greater than 1/8" in diameter, although this screen width seems adequate for field recovery methods.

A final bias was our restriction to the boundaries of Two Rivers Park. We think it is highly probable that Area A extends an unknown distance to the east, and probably goes under the road.

### 3.4 Controlled Test Excavation Methods: Phase II

Based on our findings in Phase I, of concentrated materials below a layer of Mazama ash in Area A, the Corps agreed on the necessity of Phase II, controlled excavations in this area.

The objective of Phase II was to open a sufficient number of contiguous horizontal areas containing cultural material to permit a coherent examination of the site contents; this, we hoped, would provide sufficient data to evaluate the site for NRHP eligibility.

We found the greatest concentration of features and cultural material in the vicinity of probes 35 and 36. We selected this area for controlled test excavation.

Using transit and tape, we staked out a 1 m interval grid base line, aligning it to magnetic north, with the southernmost point in the grid having the coordinates of 100 North (N)/100 West (W). The coordinates of our test units were as follows:

Test Unit 1 (a 1 x 2 m unit)  
105 to 106 N/100 to 102 W

Test Unit 2 (a 2 x 2 m unit)  
102 to 104 N/100 to 102 W

In Test Unit 1 we used 1/8" screen; in Test Unit 2 we used 1/4" mesh. We chose to use different screen sizes is because we were limited to only four days for Phase II. Screening with 1/8" mesh can be very time consuming, especially when sediments are damp and clog the screen. From the subsurface probes we knew that we would have to go at least 1.25 m down with the sediments becoming increasingly moist as we descended. Thus, we elected to use smaller mesh with the smaller unit.

As the coordinates infer, a 1 x 2 m balk from 104 to 105 N and 100 to 102 W remained unexcavated. We left this balk up for two reasons: (1) to open up as wide a contiguous area as possible; and, (2) to avoid the slumping and mixing of deposits from two different horizontal units--a frequent problem when excavating connected units through fine grained river sediments.

We set a temporary site datum in a tree about 10 m north of the excavations, assigned it an arbitrary datum of 10 m above sea level, and then recorded elevations for all surface grid coordinates. They are as follows:

<u>Coordinates</u>	<u>Elevation</u>
102 N/100 W	10.25
103 N/100 W	10.24
104 N/100 W	10.14
105 N/100 W	10.16
106 N/100 W	10.20
102 N/102 W	10.22
104 N/102 W	10.22
105 N/102 W	10.16
106 N/102 W	10.19

Initially we had planned to use Test Unit 1 as a "preview" unit; thus, we started excavating it first, and excavated the upper 20 cm before we began work in Test Unit 2. Our plan was to excavate Test Unit 1 in 10 cm arbitrary intervals, except in areas of clear stratigraphic changes. Using Test Unit 1's revealed stratigraphic profile, we planned to excavate Test Unit 2 with techniques emphasized by British archaeologists (Harris 1979a, 1979b).

We used the following criteria to distinguish stratigraphic contexts such as layers and levels. A "layer" is simply a definable deposit, whether

it be a natural layer formed by non-cultural processes or a man-made layer formed by human activity (Harris 1979a:36-37). A layer may extend across several excavation units or may only cover a small area. Layers may be horizontal, inclined or undulating and contiguous or discontinuous. A "level" is a stratum of extensive vertical consistency such as that associated with arbitrary level excavations. We would only use levels if natural stratigraphic units were thicker than 10 cm. Arbitrary levels should never exceed 10 cm in thickness, and, if necessary, may even be reduced to 5 cm intervals. Unfortunately, Test Unit 2's progress eventually matched and then exceeded that of Test Unit 1. Thus, after about 50 cm of excavation, we had no revealed stratigraphic profile to follow and relied instead on recognizing changing sediments in our floors. The only time we were able to excavate stratigraphically was when we encountered the Mazama ash layer. The rest of the time we used arbitrary 10 cm levels that we maintained with datum and transit readings (in conjunction with line levels) for vertical control.

Each level was numbered sequentially from first encountered (or latest) to last encountered (or earliest). The list below contains these numbers along with their associated elevations.

10.19 to 10.09	= Level 1
10.09 to 9.99	= Level 2
9.99 to 9.89	= Level 3
9.89 to 9.79	= Level 4
9.79 to 9.69	= Level 5
9.69 to 9.59	= Level 6
9.59 to 9.49	= Level 7
9.49 to 9.39	= Level 8
9.39 to 9.29	= Level 9
9.29 to 9.19	= Level 10
9.19 to 9.09	= Level 11
9.09 to 8.99	= Level 12
8.99 to 8.89	= Level 13
8.89 to 8.79	= Level 14

8.79 to 8.69 = Level 15  
8.69 to 8.59 = Level 16  
8.59 to 8.49 = Level 17

### 3.5 A Consideration of Biases Inherent in Controlled Excavation Methods

The primary bias in excavating test units such as those described above is that only a small horizontal percentage of an entire site is revealed. Thus, it inhibits how far interpretations can range regarding such archaeological concerns as settlement pattern, land use, seasonal cycles, functional differentiation, intrasite activity patterns, and the articulation of tool assemblages with environment. Obviously, the site may contain many more materials and patterns in its unexcavated portions.

Also, when excavating arbitrary 10 cm levels, it is possible to overlook, or not recognize, prehistoric occupation surfaces; however, we minimized this problem by excavating around materials, pedestaling them, mapping them, and recording elevations. These, of course, are standard procedures.

## PART 4 - ANALYSIS AND INTERPRETATION

### 4.1 Analysis and Interpretation of Stratigraphy

Study of the stratigraphic sequence at the Two Rivers Site began on the site's east side, near Probe No. 1 (see Figure 2), where the erosion of a high wall of the river bank had exposed its underlying surface. We cleaned the face of this eroded cut and recorded the following profile of strata (all Munsell colors were interpreted from wet, fresh, surfaces).

From the surface to approximately 90 cm below, the strata consisted of fine grained, horizontally bedded, silty sand (Munsell color 10YR5/3). This silty sand was largely alluvium, but also contained some aeolian redeposition. Silt content decreased as depth increased.

From approximately 90-104 cm below surface, we encountered a deposit of hard packed river cobbles and gravel in a coarse grained sandy silt matrix (Munsell color 10YR6/2).

Below this layer of river cobbles, and lying from 104-147 cm below surface, was a layer of river gravels and pebbles, nearly devoid of cobbles, in a silty sand matrix (Munsell color 10YR4/1).

Underlying all of these strata, from about 1.47-2.3 m (below surface) was a very coarse grained, moist, black sand (Munsell color 10YR2/1).

Mazama ash, we should emphasize, was not present in this profile. Also, when we excavated the test units we were able to interpret more discrete stratigraphic breaks in the upper 1.5 m of the deposits.

#### 4.2 Stratigraphic Sequence in Test Units

The upper layer consisted of top soil, with grass, roots, and modern cultural debris. This layer, designated stratum 1, extended from the surface to an average depth of 6 cm but never exceeded 9 cm below surface (Munsell color 10YR4/6).

Stratum 2 was a plowed zone of sandy silt that extended from approximately 6-20 cm below surface. It contained large amounts of grass roots (Munsell color 10YR6/4).

Stratum 3 was a light, grayish brown, silty sand, nearly a sandy silt (transitional). It began approximately at 20 cm below surface, and ended at about 36 cm. Root amounts noticeably decreased in this layer, as it contained only about 10 percent of the roots observed in stratum 2 (Munsell color 10YR6/2).

Stratum 4 was a grayish silty sand (silt content was quite diminished), that extended from 36-60 cm below surface. It contained very few roots but had several rodent disturbances (Munsell color 10YR6/2 to 10YR6/1).

Stratum 5 was very similar to stratum 4 but of a lighter gray color (10YR7/1), and extending from 60-78 cm below surface (sometimes reaching 85 cm in depth). It, too, had very few roots but several rodent disturbances.

Stratum 6 was an ashy sand that overlay the Mazama ash layer. Its ashy content may be a result of rodents bringing ash up from below. Stratum 6 was very indistinct in places and seemed to grade into strata 5 and 7. It extended from approximately 80-105 cm below surface (Munsell colors 10YR7/3, 10YR7/4, and 10YR6/4).

Stratum 7 was the Mazama ash layer, which began approximately 105 cm and ended at 115-120 cm below surface. This layer was uneven, undulating, and had suffered from rodent disturbances. Munsell colors were 5YR8/3, 10YR7/4, 10YR8/3, and 10YR7/2.

Stratum 8, located at the bottom of stratum 7, was the "Cascade Floor" stratum. It consisted of a dark brown (10YR5/4), moist, very compacted sand, with some light and dark mottling. Stratum 8 extended from 110-115 to 128 cm below surface.

Stratum 9 was very similar to stratum 8, but much damper and extended from approximately 130-180 cm below surface where it abutted a thick layer of river cobbles (see above description).

Thus, the layer of river cobbles described above was Stratum 10. The layer of gravel was stratum 11 and the coarse, black sand was stratum 12. When we were profiling the river bank we screened samples of all strata but did not recover cultural debris from strata 10, 11, or 12. These layers were culturally sterile subsoils (see discussion below).

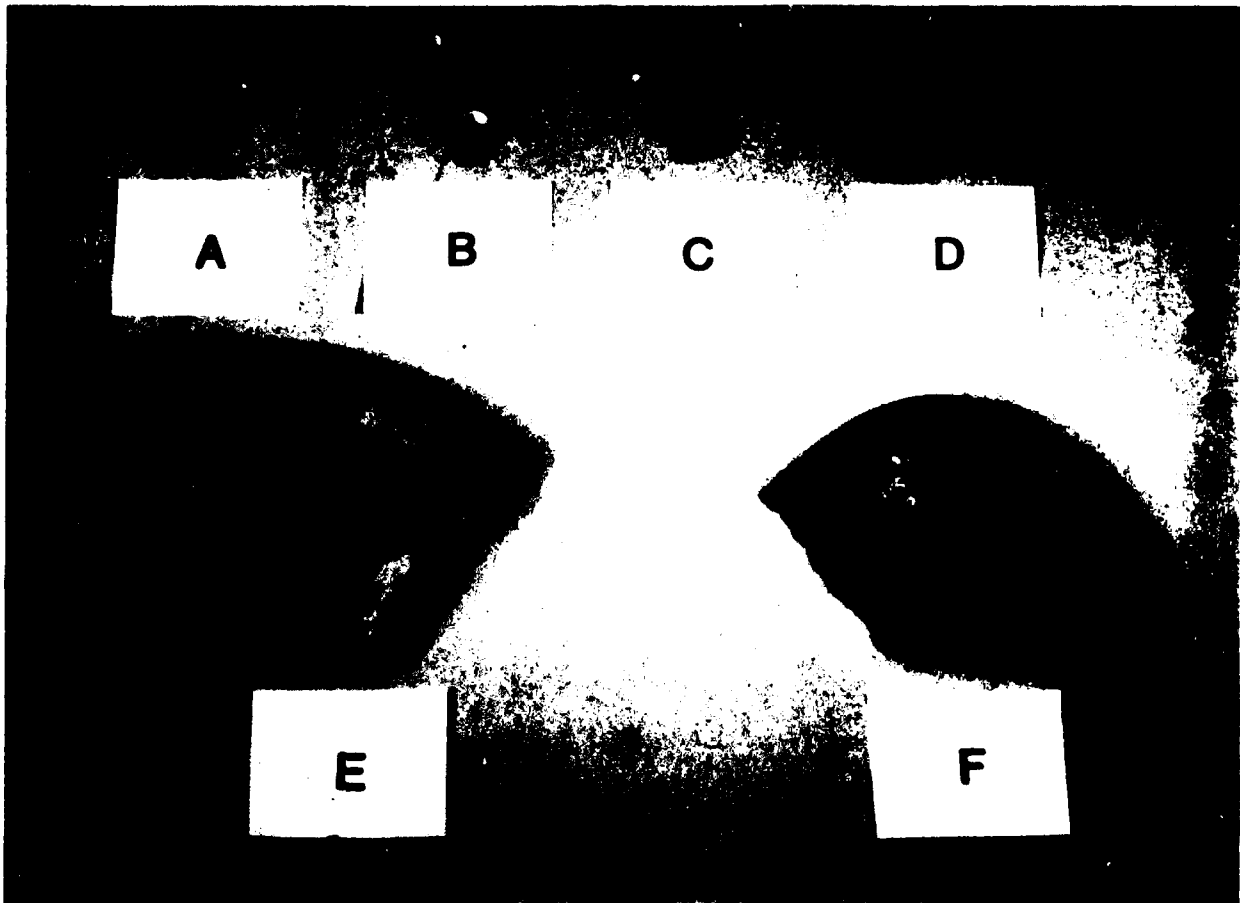
#### 4.3 Relative Age of Deposits: A Summary

The topsoil, stratum 1 is relatively recent and, given the presence of modern cultural debris, probably no more than fifty years old. The same judgement also applied to the underlying plow zone of stratum 2, though it may be somewhat older, dating from the historic to modern eras, (i.e. it was formed within the last 100 years).

At the top of stratum 3 we recovered one of the three diagnostic projectile points recovered from the test excavations (Figure 3). It is a



FIGURE 3



stemmed, resharpened arrow point, that prior to resharpening may have resembled Nelson's (1969), Type 8. If it is a Type 8 variant, it corresponds to Nelson's (ibid.) Cayuse II/III phase, and dates stratum 3 to approximately 1000-1800 A.D. (provided it was not redeposited as a result of disturbances). One rather ambiguous projectile point is slim evidence for dating these upper deposits; unfortunately, we did not encounter any other diagnostic artifacts until we were below the Mazama ash layer, when we encountered artifacts of the Cascade phase. These finds date strata 4 through 6 from after 6700 B.P. (the time of Mt. Mazama's eruption) to about 1000 B.P. Obviously, strata 7 dates to 6700 B.P. and strata 8 and 9 predate 6700 B.P. by an unknown interval. Two Cascade projectile point fragments recovered from these strata, however, suggest a conservative estimate of 7000 B.P. (or 5000 B.C.) for these deposits (Nelson 1969; Dumond and Minor 1983).

#### 4.4 Analysis of Occupation Surfaces

In this section, we confine our analysis to those occupation surfaces that we encountered in the course of excavating Test Units 1 and 2. We have already discussed the geological aspects of these surfaces in the preceding section and provide summary results of all cultural materials in Appendix 2. In the following discussion, therefore, we only summarize these data for purposes of clarity and meaningful comparison.

Level 2 (10.09-9.99) revealed the first occupational stratum, just below the old plow zone. Though low in artifacts, this level did contain Feature 1, a scatter of fire-fractured and burned rock in association with ashy sand. Feature 1 was probably a dispersed hearth (Figure 4). Most of the artifacts were from areas peripheral to an ashy sand zone that contained small flecks

balk

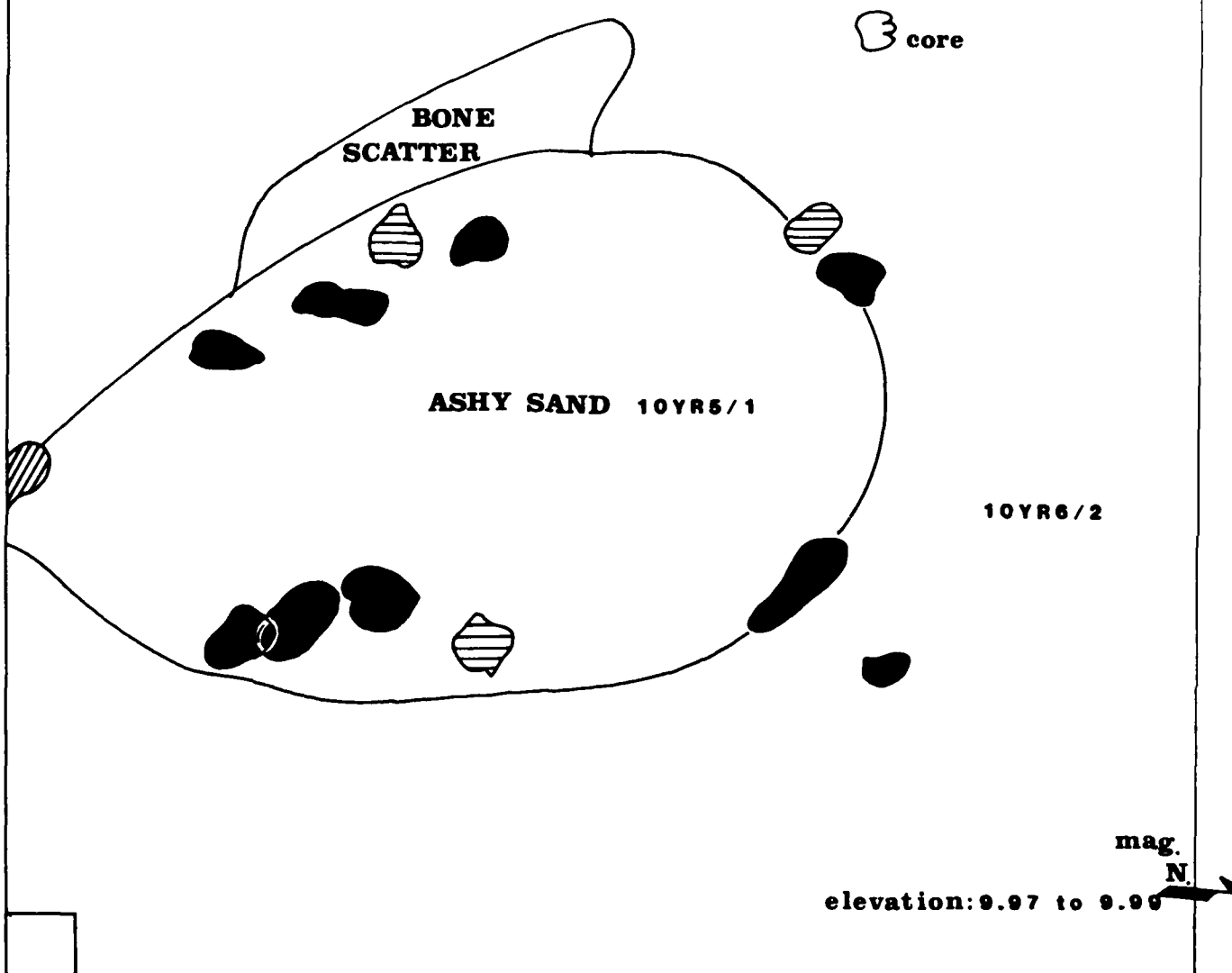


FIGURE 4



10 cm

plan map FEATURE ONE  
TEST PIT TWO

A POSSIBLE DISPERSED HEARTH

8-20-83

■ BASALT

▨ QUARTZITE

□ CCS

▨ FCR

of carbon. As is discussed below, overall artifact inventory from this level (see Appendix 2) is indicative of a brief, temporary occupation where such activities as food and hide preparation, tool maintenance, and/or replacement of hafted tools were conducted.

The presence of the utilized and retouched flakes and the scraper suggest food preparation or woodworking; the hammerstone, core fragment, and lithic debitage indicate tool maintenance. The core is a battered, exhausted quartzite nodule, which has undergone the bi-directional removal of flakes. Its appearance may indicate a bi-polar reduction technique, but the flakes recovered from this level are mainly interior basalt and cryptocrystalline silicate (ccs) flakes that do not exhibit evidence of bi-polar reduction.

As described above, a possible CayuseII/III projectile point from this level tentatively dates this occupation surface from 1000-1800 A.D. The latter date may be excessively late, since we found no historic artifacts at this level. This is rather equivocal, however, since historic artifacts need not be present for deposits to be historic.

From Level 3 to Level 9, we encountered very little cultural debris and much of what we did recover may have been the result of root and rodent disturbances displacing objects downwards from Level 2. Other materials may have resulted from very brief occupations, but this is very difficult to assess given the small sample size.

The cultural debris in Levels 10 through 12, on the other hand, might possibly be the result of the upwards displacement of materials from Level 13. The roughly circular, light colored patches of ashy sand found in these levels provide obvious signs of numerous rodent disturbances. Alternatively,

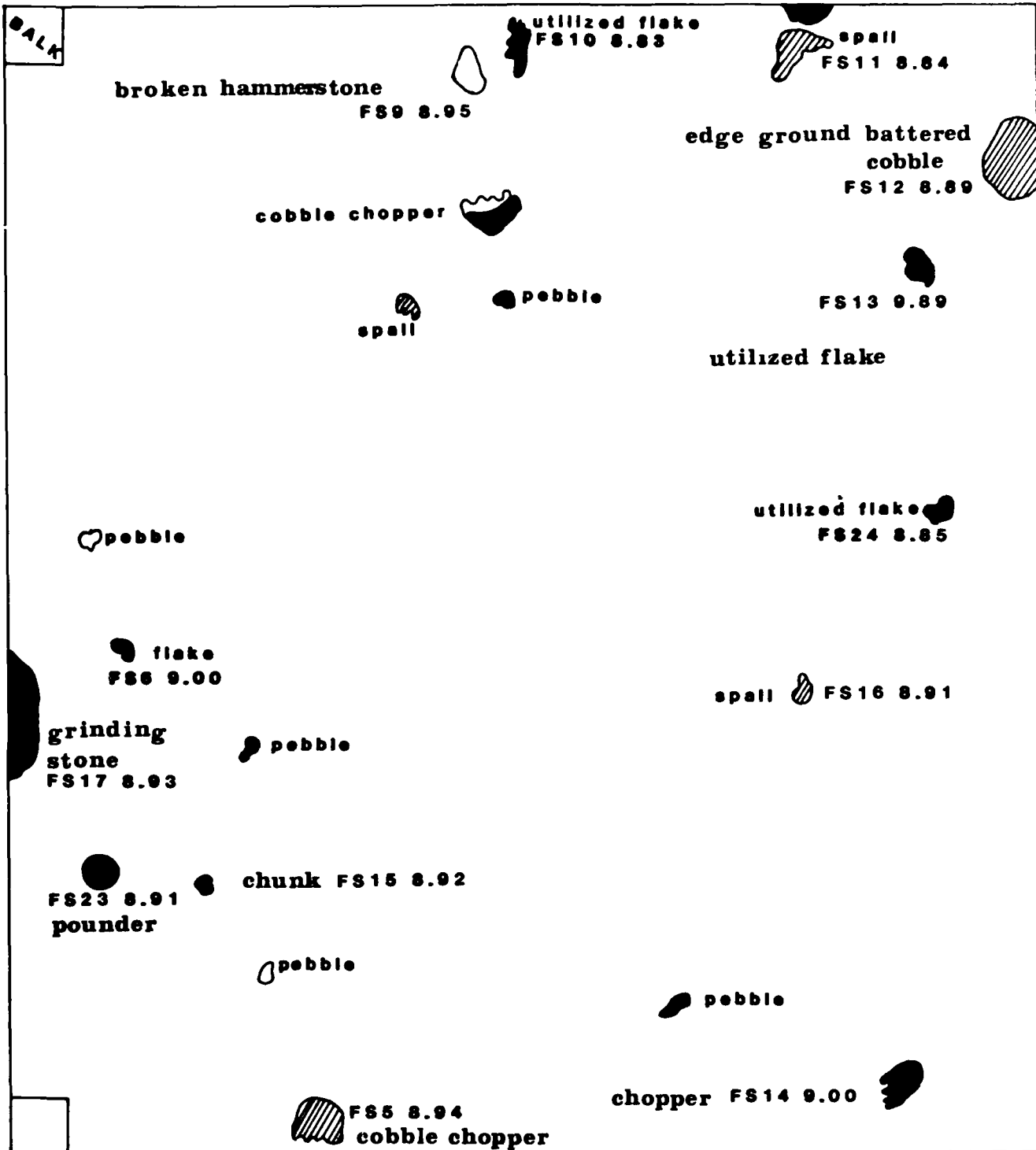
most of the materials from Levels 10 through 12 could represent scattered debris from brief, temporary occupations; many authorities, however, have demonstrated that bioturbative processes easily displace materials in fine grained sands. For example, in sandy aeolian deposits at single component sites like Meer III in Belgium (Van Noten 1978) and the Debert site in Nova Scotia (MacDonald 1968), artifacts of a single time phase were displaced throughout .5 m of the profile.

Binford (1981) described a common syndrome among archaeologists as the "Pompeii Premise", that is the tendency to view cultural strata as undisturbed, with artifacts and features lying around just as the Indians left them several thousand years ago. The often overlooked reality is that there are no undisturbed sites, and we must always consider post depositional processes. Many deep alluvial sites, such as Two Rivers, contain only minimal post depositional disturbances, but one has to assume that the actual depositional events themselves (aeolian, alluvial, and colluvial, as well as anthropogenic) have caused some displacement. Generally, such displacement moves materials below the surface where they originally lay. This process may account for much of the material recovered from below Levels 13 and 14 in test Units 1 and 2 (see Appendix 2). Alternatively, these materials could result from superimposed occupation surfaces.

We found at least one occupational surface within Levels 13 and 14, in Features 2 and 3 (Figures 5 and 6), and we designated it the "Cascade Floor" (Features 2 and 3 are probably part of the same feature, or floor, though they carry different numbers because they occurred in two different units separated by an unexcavated balk). Most of the artifacts plotted in Features

102N/102W

2.99



102N/100W

FIGURE 5

8-22-83

10 cm

plan map FEATURE TWO  
TEST PIT TWO

BASALT

QUARTZITE

CCS

FCR

105N/102W

106N/102W

BALK




chopper FS22 2.96

pecking stone FS21 2.96

cascade projectile point base  
FS18 2.95

burned hammerstone FS19 2.95

denticulate FS20 2.97

-  BASALT
-  QUARTZITE
-  CCS

mag.  
N.

105N/100W

106N/100W

plan map FEATURE THREE  
TEST PIT ONE  
bottom of level 13

8-22-83

FIGURE 6

2 and 3 were within 6 vertical cm of each other (8.89-8.95 m above sea level according to the arbitrarily defined site datum); however, at the bottom of Level 14 (Figure 7), we discovered a concentration of artifacts between the vertical intervals of 8.77-8.81 m. This artifact concentration may represent another occupational surface, but, with such a small horizontal area exposed, such an interpretation is problematic.

In both of these possible occupational surfaces, there is a very strong probability of both horizontal and vertical displacement occurring after initial deposition. Yet this possible displacement does not seem to have been too marked, for in both cases we found these materials in rather narrow vertical ranges.

The "Cascade Floor" materials preserve the whole gamut of activities associated with a residential base camp (cf. Binford 1980:9-13). Evidence for this statement comes from our retrieval of such artifacts and associated activities as ground stone tools for plant processing; hammerstones and lithic debitage for tool manufacturing and maintenance; choppers, scrapers, unifaces, utilized flakes and diverse faunal remains. The Cascade projectile point fragment (Figure 6), may have been returned to the site for retooling. As Keeley (1982) has pointed out, the actual haft itself was usually of more logistical importance than its associated tool that was more expeditiously manufactured.

There is little more to add, for, as discussed above, the small horizontal areal sample limits the interpretation of these excavated portions; other, perhaps very different, patterns may be present in the unexcavated portions.



105N/102W

106N/102W

balk

cobble spall FS25 2.01

pecking stone

FS26 3.01

chopper in wall  
FS32

pecking stone  
FS27 3.02

biface fragment  
FS28 3.00

anvil stone FS30 2.98

scraper FS29 3.00

 BASALT

 QUARTZITE

 CCS

mag. N.

plan map TP1  
bottom of level 14

105N/100W

106N/100W

8.23.83

FIGURE 7

#### 4.5 Lithic Analysis of Cascade Components at the Two Rivers Site

Artifact categories are described as follows:

Biface: This is a tool which has had flake removals from both its dorsal and ventral surfaces as well as along at least one edge. In this report we separate bifaces into thin (less than 5 mm) and thick categories. In some cases thin bifaces were probably used as cutting tools or knives and thick bifaces may have had other uses (such as chopping and/or cutting). They also may have been "preforms", that is bifaces probably intended for further modification into knives or projectile points.

Biface Thinning Flakes: Flakes detached from a preform either by pressure or percussion for thinning. Thinning flakes are also detached to thin a biface or uniface. Usually these flakes exhibit special platform preparation and have small ridges (called lips) on the ventral face between the bulb and the platform.

Chunk: These are angular pieces of raw material removed during the initial reduction of the core. They are often brittle and fragmentary and usually have one or more cortex faces, but lack an identifiable bulb and/or platform.

Cores: Cores are pieces of siliceous stone or other raw materials which have at least one surface showing evidence of flake removal.

Core Tools: These tools exhibit characteristics of cores but additionally show marginal retouch, modification, or wear (observable alteration caused by use) along portions of the edge.

Cortex: A stone's natural, weathered surface.

Flake: A piece of stone removed from a core (or other artifact) through the introduction of force into the core. In this report, we consider flakes to be only the result of human flintworking activities. Diagnostic attributes of a flake are: a striking platform, ripples, fissures, and a bulb of percussion.

Flakes with Edge Modification: These are flakes which show modification on one or more edges; however, we are unable to determine whether the edge modification resulted from cultural or natural processes on these specimens.

Hammerstones: These are usually round or rounded nodules of stone which show evidence of battering (small craters, abrasions, etc.,) on one or more ends.

Interior Flake: A flake lacking a cortex, usually the most common flake form found at a site. Interior flakes are flintworking debitage produced from a core, another flake, or a tool lacking a cortex because of previous flake removals.

Primary Cortex Flake: A cortex dorsal surface characterizes this type of flake.

Projectile Point: Usually a bifacial tool used on the distal end of a projectile such as an arrow, atlatl dart, or spear; most people recognize it as an "arrowhead".

Scrapers: These formalized tools show either unifacial or bifacial modification, and may also have steep edge angles. Wear patterns are often common along edges in the form of edge damage, striations and/or polish.

Secondary Cortex Flake: A flake that shows some cortex remaining on the dorsal surface. These flakes are indicative of flintworking activities.

Unifaces: Unifaces are tools which show modifications on only one surface and one edge. Edge modification in this case is the result of intentional retouch and use. The uniface category applies to any non-formalized unifacially worked tool (does not apply to scrapers).

Utilized Flakes: These are tools which show modifications on one or more edges or surfaces through use and not intentional retouch.

As Appendix 2 indicates, the bulk of the lithic debitage from the levels below the Mazama Ash layer (Levels 12 to 16) were of cryptocrystalline silicate, containing mostly chert with low amounts of Jasper. The bulk of this debitage consisted of interior flakes; there were very few primary cortex flakes. Because of their large size and the relatively small surface area of their mother nodule primary cortex flakes often occur in low frequencies at archaeological sites. In spite of these considerations, however, they seem rather scarce in Test Units 1 and 2. The shovel and auger subsurface probes near the riverbank did obtain numerous primary cortex flakes and hammerstones (see Appendix 1), and possibly most initial reduction and decortication occurred closer to the source of acquisition (i.e. the prehistoric shoreline). The roundness of the stream-rolled cobble tools and cortex flakes strongly indicate that the riverbed was the major source of raw material for the prehistoric inhabitants.

The cryptocrystalline silicate flakes were of a variety of different cherts and jaspers, with no one color or type dominating the assemblage. This trend towards diversity among material types, coupled with the high frequency of small interior flakes, suggests that the prehistoric inhabitants directed most flintworking (in the excavated portions of the site) to tool

maintenance and recycling rather than manufacturing. The few cores from these levels are small, exhausted and haphazardly shaped, indicative of an opportunistic approach to lithic manufacturing.

Though the sample is small, it has general similarities with other Cascade phase assemblages (Nelson 1969:15); the numerous Basalt unifacially flaked cobbles and edge ground cobble fragments especially show a strong relation to other sites in the region. The flake tools and utilized flakes are less diagnostic, but at the Two Rivers Site these tools were manufactured on large flakes (Figure 3:d), a pattern seen at other sites on the Columbia Plateau (Nelson 1969:15).

#### 4.6 Summary

The Two Rivers Site (45BN14) is a multicomponent site complex consisting of three different site areas (Figure 1). On the easternmost edge, Area A is a multicomponent, stratified site, containing Late Prehistoric materials in the upper 40 cm. Below a Mazama Ash layer, from a depth of 1.3-1.7 m below surface, there are well-preserved Cascade phase materials. The Late Prehistoric occupations may have been of a brief, temporary nature, whereas in contrast the Cascade components resemble materials associated with a longer term residential base camp.

In the central portion of the site (Area C) is a buried component, ca. 50-60 cm below surface (see Appendix 1), of unknown time depth or functional type. A high dam pool separates Area B, an isolated spit of high ground on the western side of the site, from areas A and C. Based on limited surface examination as well as study of a local collection, Area B seems to be a Late Prehistoric village site with an associated linear midden oriented parallel

to the river bank. Local collectors are picking over this eroding river bank midden.

In Area A, the upper Late Prehistoric component seems to extend approximately 70 m east-west, and 25 m north-south. The Cascade materials extend over an unknown horizontal area, but appear to concentrate towards the river bank. Area C seems confined to a zone of about 20 square m in the central part of the study area. Area B is of unknown horizontal extent, for most of it is presently underwater. We cannot determine the intrasite patterns or foci of activities from the present data.

The Two Rivers Site seems to contain materials dating from just prior to European contact back to before the eruption of Mount Mazama (6700 B.P.), possibly even earlier than 7000 B.P. Buried deposits at the site extend to a depth of approximately 1.7 m below the present ground surface. Controlled excavations recovered only three diagnostic artifacts representing the upper and lower ends of the prehistoric sequence, but intervening phases may be present in the unexcavated portions of the site. The best represented occupations were the earliest and lowest levels (13-15) (the Cascade phase levels) which contained abundant lithic debitage, Molluscan remains, and animal bones.

From a regional perspective, the Cascade phase component at the Two Rivers Site is a relatively uncommon occurrence. Investigators have found Cascade occupations intermittently along the Columbia Drainage system, although the later post-Mazama subphases are more common than the pre-Mazama Ash or early Cascade subphases which we encountered at the Two Rivers site.

The Cascade projectile point was first defined by Butler (1961). A large sample of Cascade points was subsequently recovered at Cascadia Cave. Newman (1966) carried out archaeological salvage operations for the National Park Service in the prospective flood area of Cascadia Dam. During these operations he encountered a stratified site at Cascadia Cave with an initial occupation radiocarbon dating of 7910 B.P. (Newman 1966:23). Since the Cave had severely disturbed upper levels, Newman failed to provide a detailed stratigraphic provenience description for the materials he recovered. These upper levels contained both thick, side-notched projectile points (sometimes designated Northern Side-Notched or Cold Springs Side-Notched) and leaf-shaped projectile points (which through common usage came to be called "Cascade" points), but the lower levels revealed only the leaf-shaped Cascade points. This initial and basic conundrum of two kinds of occupations containing leaf-shaped Cascade points (i.e. one with leaf-shaped projectile points and side-notched points, and another with predominantly leaf-shaped points and few or no side-notched points) also appeared at other sites within the Columbia drainage system (Nelson 1969:14-15). The later occupations containing both leaf-shaped and side-notched forms came to be called the Cold Springs Phase on the Lower Snake River (Nelson 1969:14-15); Leonhardy and Rice (1970), however, have designated the two subphases as early and late Cascade.

Except for the differences in projectile point inventories, the two subphases are very similar, a fact noticed at Cascade Cave as well as at the subsequent excavation and analysis of other sites. Concerning the artifact inventory for the two subphases, Leonhardy and Rice observed (1970:9):

Large, generally well-made lanceolate and triangular knives are characteristic. Tabular and keeled end scrapers are common. Large, varied, utilized flakes are numerous in most assemblages...Cobble implements include large scraper-like implements, pounding stones, small grinding stones of questionable interpretation, and a second hallmark artifact, the edge-ground cobble...

Leonhardy and Rice (9), also observed that cryptocrystalline silicate materials are "abundant in some earlier subphase assemblages". In this characteristic, and all of those cited above, the Cascade subphase at Two Rivers is very similar to the early subphase, and probably is the only subphase encountered during our limited test excavations. Preliminary studies indicate that the bulk of our faunal material from Two Rivers includes deer, possibly elk, rabbit, river mussels, and salmonids. This faunal assemblage is very similar to that found at other Cascade phase sites on the Lower Snake, a strong indication that Two Rivers may have relationships with such other sites as Ash Cave (45WW61) (Butler 1962), (45WT31) and Wexusnime (45AG61), Windust Caves, Marmes Rockshelter, Granite Point, and Thorn Thicket (Leonhardy and Rice 1970).

Work by Brauner (1976), at Alpawai, documented that the Cascade Phase was the beginning of the use of semi-subterranean pithouses in the Pacific Northwest. Thus, the so-called "emergence" of Plateau culture may date to the Cascade phase and may have considerable more time depth than previously thought (Browman and Munsell 1969). It is possible that pit houses may be present in the unexcavated portions of 45BN14A; in any case, the excavated evidence from Two Rivers may be indicative of either long term residential occupation or one component of a semi-sedentary settlement system, similar to that in use during the ethnohistoric period on the Columbia Plateau.



## PART 5 - RECOMMENDATIONS

### 5.1 Management Recommendations

Each site area within the site complex of 45BN14, requires different forms of management on the part of the U.S. Corps of Engineers, and this section of the report details the necessary actions. Various modern cultural activities have had at least some adverse impact on everyone of the subject areas.

Off the road vehicle "recreation" has been the most damaging activity in Areas A and C: ruts over 50 cm deep, clearly visable in this part of the site, have caused severe damage to its upper Late Prehistoric component. We strongly recommend prohibiting all vehicles on those access roads which pass through the eastern portion of the site in the vicinities of Areas A and C. The Cascade component in Area A is so deeply buried that it is safe from severe disturbances; however, we feel that further block area excavations in the area around Test Units 1 and 2 are necessary in order to obtain a better understanding of this component and those above it. Such excavations are not of immediate importance, for this portion of the site is not as endangered as are other portions. In addition, archaeological excavation and analytical methods will improve as time passes; this particular recommendation, then, is really part of a long-range management plan.

In the shorter term, we recommend that the Corps of Engineers sponsor test excavations similar to those in this report in both Areas B and C, so that we may better understand the buried components that we now know exist in these areas. A crew of four should be able to excavate two 2 x 2 m units in

about thirty-two field hours. In Area B, a crew of four would need to excavate the equivalent of at least four 2 x 2 m units, and would require approximately eighty field hours to do an adequate job of testing; furthermore, any testing planned for Area B should be conducted when the dam pool is at its lowest elevation, a condition that would enable the field crew to proceed to this part of the site without the need of a row boat. Area B also is suffering substantial erosion as a result of river traffic wave action on the bank. We can think of little that could be done to protect Area B from this erosion short of constructing an expensive breakwater, or alternatively, covering the bank in a thick layer of river cobbles. The gradual washing away of this part of the site lends urgency to the proposed testing program outlined above.

#### 5.2 Recommendations for Assessment of National Register of Historic Places Eligibility

The objective of the research that this report describes was to conduct a cultural resources investigation and evaluation of the Two Rivers Site (45BN14) for the purpose of determining the site's eligibility to the National Register of Historic Places (NRHP).

We think the fact that the site contains well preserved Cascade phase materials is reason enough for its inclusion within the NRHP. Components from this era are relatively uncommon both on the Columbia Plateau in general and in the Middle Columbia Basin in particular.

Thus, we recommend the site for inclusion within the National Register of Historic Places, with the considerations listed below. We need to know more about the following two questions: (1) What is the nature and extent of

the components buried in Areas B and C? 2) Are there other well-preserved components in the unexcavated portions of Area A?

## PART 6 - REFERENCES

- BINFORD, L.R.  
1980 Willow smoke and dog's tails: Hunter - gatherer settlement systems and archaeological site formations. *American Antiquity* 45(1):4-20.
- 1981 Behavioral archaeology and the "Pompeii premise". *Journal of Anthropological Research* 37(3):195-208.
- BRAUNER, D.R.  
1976 Alpowai: The culture history of the Alpowa locality. Ph.D. dissertation, Department of Anthropology, Washington State University.
- BROWMAN AND MUNSELL  
1969 Columbia Plateau prehistory: Cultural development and impinging influences. *American Antiquity* 34(3):249-264.
- BURTCHARD, G.C.  
1981 Test excavations at Box Canyon and three other side canyon sites in the McNary Reservoir. Laboratory of Archaeology and History Washington State University, Project Report Number 10.
- BUTLER, B.R.  
1962 Contributions to the prehistory of the Columbia Plateau: A report on excavations in the Palouse and Gaig Mountain sections. Occasional Papers of the Idaho State College Museum, Number 9.
- CHALFANT, S.A.  
1974 A report on anthropological and ethnohistorical material relative to aboriginal land use and occupancy by the Columbia Salish of central Washington. In *Interior Salish and Eastern Washington Indians IV*. D.A. Horr (ed.), pp. 229-307. New York.
- CHATTERS, J.C.  
1980 Cultural resources of the Columbia Basin Project: An inventory of selected parcels. Office of Public Archaeology, Institute for Environmental Studies, University of Washington. Reconnaissance Report No. 32.
- CLEVELAND, G., B. COCHRAN, J. GINIGER AND H. HAMMAT  
1976 Archaeological reconnaissance on the Mid-Columbia and Lower Snake River Reservoirs for the Walla Walla District Army Corps of Engineers. Washington Archaeological Research Center, Washington State University, Project Reports 27.

- DALQUEST  
1948 Mammals of Washington. University of Kansas Publications 2.
- DAUBENMIRE, R.F.  
1970 Steppe vegetation of Washington. Washington Agricultural Experiment Station. Technical Bulletin 62.
- DRUCKER, P.K.  
1948 Appraisal of the archaeological resources of the McNary Reservoir, Oregon and Washington. Ms. on file, Columbia Basin Project, River Basin Surveys. Smithsonian Institution, Washington, D.C.
- DUMMOND, D.E. AND R. MINOR  
1983 Archaeology in the John Day Reservoir: The Wildcat Canyon Site 35-GM-9. University of Oregon Anthropological Papers, Number 30.
- FRYXELL, R.  
1965 Mazama and Glacier Peak volcanic ash layers--relative ages. Science. 147:1288-90.
- FRYXELL, R. and E.F. COOK  
1964 A field guide to the loess deposits and channeled scablands of the Palouse area, Eastern Washington. Washington State University, Laboratory of Anthropology, Report of Investigations 27.
- HARRIS, E.C.  
1979a Principles of Archaeological Stratigraphy. Academic Press. London.  
1979b The laws of archaeological stratigraphy. World Archaeology 11: 111-117.
- KEELEY, L.H.  
1982 Hafting and retooling: Effects on the archaeological record. American antiquity 47(4):798-809.
- LEONHARDY, F.C. AND D.G. RICE  
1970 A proposed culture typology for the Lower Snake River region, Southeastern Washington. Northwest Anthropological Research Notes 4(1):1-29.
- MACDONALD, G.F.  
1968 Debert: A Paleo-Indian site in central Nova Scotia. National Museum of Canada Anthropology Papers, Number 16.
- NELSON, L.M.  
1969 The Sunset Creek site (45-KT-28) and its place in plateau prehistory. Washington State University Laboratory of Anthropology, Report of Investigation, Number 47.

- NEWMAN, T.M.  
1966 Cascadia Cave. Occasional Papers of the Idaho State University Museum, Number 18.
- OSBORNE, H.D.  
1949 The Archaeological investigations of two sites in the McNary Reservoir, Washington. Ms. on file, Columbia Basin Project, River Basin Surveys. Smithsonian Institution, Washington, D.C.
- 1957 Excavations in the McNary Reservoir Basin near Umatilla, Oregon. Bureau of American Ethnology, River Basin Survey Papers 8, Bulletin 166.
- OSBORNE, H.D. AND J.L. SHINER  
1950 River Basin Surveys-State College of Washington archaeological investigations in the Lower McNary Reservoir Oregon, 1949. Ms. on file, Columbia Basin Project, River Basin Surveys. Smithsonian Institution, Washington, D.C.
- 1951 The 1950 excavations in two McNary Reservoir sites, Washington and Oregon. Ms. on file, Columbia Basin Project, River Basin Surveys. Smithsonian Institution, Washington, D.C.
- OSBORNE, D., A. BRYAN, AND R.H. CRABTREE  
1961 The Sheep Island site and the Mid-Columbia Valley. Bureau of American Ethnology, River Basin Survey Papers 24, Bulletin 179, pp. 267-306.
- PETTIGREW, R.M.  
1981 A prehistoric culture sequence in the Portland Basin of the Lower Columbia Balley. University of Oregon Anthropological Papers, Number 22.
- 1983 Archaeological reconnaissance of the Interstate 82 Project, Umatilla County, Oregon. Oregon State Museum of Anthropology Report 83-2.
- RAY, V.F.  
1939 Cultural relations in the Plateau of northwestern North America. F. W. Hodge Anniversary Publications Fund, Southwest Museum 3.
- 1936 Native villages and groupings of the Columbia Basin. Pacific Northwest Quarterly. 27:99-152.
- SCHALK, R.F.  
1980 Archaeological investigations for the second powerhouse project at McNary Dam, near Umatilla, Oregon. Laboratory of Archaeology and History, Washington State University, Project Reports 1.

- SCHUSTER, H.  
1975 Yakima Indian traditionalism: A study in continuity and change. Ph.D. dissertation. University Microfilms. Ann Arbor.
- SHINER, J.L.  
1951 The excavations at site 35-UM-5 in the McNary Reservoir, Oregon. Ms. on file, Columbia Basin Project, River Basin Surveys. Smithsonian Institution, Washington, D.C.  
  
1961 The McNary Reservoir: A study in plateau archaeology. Bureau of American Ethnology, River Basin Survey Papers 23, Bulletin 179, pp. 149-266.
- STRAND, J.R. and J. HOUGH  
1952 Age of the Ringold Formation. Northwest Science 26(4).
- TEIT, J.H.  
1928 The Middle Columbia Salish. University of Washington. Publications in Anthropology 2.
- THOMS, A.V. et. al.  
1983 Archaeological investigations in Upper McNary Reservoir: 1981-1982. Laboratory of Archaeology and History, Washington State University Project Report Number 1/5.
- THWAITES, R.G.  
1905 Original journals of the Lewis and Clark expedition, 1804-1806. Volume 3. New York.
- VAN NOTEN, F.  
1978 Les Chasseurs de Meer. Dissertationes Archaeologicae Gandenses 18. De Tempel, Brugge.

APPENDIX 1

DESCRIPTION AND INVENTORY OF SUBSURFACE PROBES

Probe No.: 1

Maximum Depth: 85 cm below surface

Type: Shovel and Auger

Diameter: 36 cm

Fill Description: Silty sand to 85 cm below surface where  
river cobbles were encountered.

Cultural Debris Recovered: 1 fragment of Umbo shell at approx-  
imately 62 cm below surface.

Screen Diameter: 1/8"

Probe No.: 2

Maximum Depth: 1.15 m below surface

Type: Shovel and Auger

Diameter: 36 cm

Fill Description: Road gravel to 22 cm, from 22-115 cm below  
surface fill was homogenous sand.

Cultural Debris Recovered: None

Screen Diameter: 1/8"



Probe No.: 3

Maximum Depth: 1.60 m below surface

Type: Shovel and Auger

Diameter: 36 cm

Fill Description: Surface to 38 cm was road gravel and homogenous sand mixed. Below 38 cm compacted, homogenous sand, becoming damper after 110 cm.

Cultural Debris Recovered: All of the following was recovered from below 50 cm below surface:

- 1 large basalt uniface (8 x 5.7 cm)
- 1 quartzite exhausted core fragment
- 18 basalt waste flakes
- 3 quartzite waste flakes
- 2 ccs microflakes
- 1 shell fragment (unidentifiable)

Screen Diameter: 1/8"

Probe No.: 4

Maximum Depth: 1 m below surface

Type: Shovel and Auger

Diameter: 36 cm

Fill Description: Surface to 22 cm dense packed gravel and sand. Homogenous sand from 22 cm - 1 m.

Cultural Debris Recovered: 1 large, utilized basalt flake (30 cm)  
1 edge ground basalt cobble fragment (35 cm)  
1 basalt waste flake  
2 ccs microflakes  
1 shell fragment

Screen Diameter: 1/8"

Probe No.: 5

Maximum Depth: 1.05 m below surface

Type: Shovel and Auger

Diameter: 25 cm

Fill Description: Gravel to 20 cm, moist homogenous sand to 105 cm.

Cultural Debris Recovered: Following materials came from below 90 cm:

- 1 quartzite primary cortex flake
- 1 basalt waste flake
- 2 shell fragments

Screen Diameter: 1/8"

Prob No.: 6

Maximum Depth: 1.0 m below surface

Type: Shovel

Diameter: 36 cm

Fill Description: Sand, homogenous, getting increasingly damp as depth decreases. A few scattered pebbles in fill.

Cultural Debris Recovered: Following material was recovered from 50-100 cm below surface:

- 7 basalt waste flakes
- 5 quartzite waste flakes
- 30 small fragments of shell
- 1 piece of bird bone (unidentifiable)
- 1 chunk of fire-cracked rock (FCR)

Screen Diameter: 1/8" to 90 cm  
1/4" 90-100 cm (due to moist sand)

Probe No.: 7

Maximum Depth: 1.0 m below surface

Type: Shovel and Auger

Diameter: 35 cm

Fill Description: Homogenous sand with minimal pebble content to 80 cm. 80-100 cm muddy, silty sand.

Cultural Debris Recovered: Approximately 30 shell fragments below 80 cm.

Screen Diameter: 1/4"

Probe No.: 8

Maximum Depth: 84 cm below surface

Type: Shovel

Diameter: 32 cm

Fill Description: Surface to 84 cm sand with occasional pebbles.

Cultural Debris Recovered: Below 80 cm we recovered:

1 battered cobble (possible hammer-stone)

2 basalt waste flakes

Screen Diameter: 1/4"

Probe No.: 9

Maximum Depth: 80 cm below surface  
(encountered water table at bottom)

Type: Shovel

Diameter: 35 cm

Fill Description: Surface to 50 cm, fine grained dry sand.  
50-80 cm coarse grained, blacker sand.

Cultural Debris Recovered: Between the surface and 50 cm we  
recovered: 4 basalt flakes. Be-  
tween 50-80 cm we recoverd: 1  
quartzite waste flake.

Screen Diameter: 1/4"

Probe No.: 10

Maximum Depth: 60 cm below surface

Type: Shovel

Diameter: 35 cm

Fill Description: Surface to 60 cm sand with a few pebbles,  
very recent cultural debris. Sand was very  
damp, water table encountered at 60 cm below  
surface.

Cultural Debris Recovered: No prehistoric materials, modern  
bottle glass was encountered.

Screen Diameter: 1/4"

Probe No.: 11

Maximum Depth: 65 cm below surface

Type: Auger

Diameter: 35 cm

Fill Description: Surface to 65 cm -- very moist sand. Encountered water table at 65 cm below surface.

Cultural Debris Recovered: None

Screen Diameter: 1/4"

Probe No.: 12

Maximum Depth: 1.10 m below surface

Type: Shovel and Auger

Diameter: 35 cm

Fill Description: Surface to 25 cm below, sand and pebble mixture with modern bottle glass as primary cultural debris. From 25-75 cm, very moist, wet sand. At 80 cm we recovered one possible fragment of FCR. From 80-110 cm, fill was muddy, wet sand with a few river cobbles.

Cultural Debris Recovered: Other than modern beer and wine bottle glass, none observed or collected.

Screen Diameter: 1/4"

Probe No.: 13

Maximum Depth: 55 cm below surface

Type: Shovel

Diameter: 32 cm

Fill Description: Homogenous silty sand from surface to 55 cm,  
where we encountered the water table.

Cultural Debris Recovered: None

Screen Diameter: 1/4"

Probe No.: 14

Maximum Depth: 42 cm below surface

Type: Shovel

Diameter: 32 cm

Fill Description: Homogenous sand with roots and bark to 20  
cm. Wet sand to 42 cm, where water table  
was encountered.

Cultural Debris Recovered: None

Screen Diameter: 1/4"

Probe No.: 15

Maximum Depth: 71 cm below surface

Type: Shovel

Diameter: 32 cm

Fill Description: Surface to 71 cm, a matrix of silty sand and  
pebbles, very moist all the way to the  
bottom, where water table was encountered.

Cultural Debris Recovered: None

Screen Diameter: 1/4"

Probe No.: 16

Maximum Depth: 57 cm below surface

Type: Shovel

Diameter: 32 cm

Fill Description: Surface to 57 cm was a mottled gray and reddish brown sand with small amounts of pebbles and gravel. Fill was very wet and water table was encountered at 57 cm below surface.

Cultural Debris Recovered: None

Screen Diameter: 1/4"

Probe No.: 17

Maximum Depth: 60 cm below surface

Type: Shovel

Diameter: 30 cm

Fill Description: Surface to 60 cm, a moist sand with small mixture of pebbles and cobbles. Encountered water table at 60 cm.

Cultural Debris Recovered: None

Screen Diameter: 1/4"

Probe No.: 18

Maximum Depth: 36 cm below surface

Type: Shovel

Diameter: 32 cm

Fill Description: Surface to 36 cm wet, silty, sand until water table encountered.

Cultural Debris Recovered: None

Screen Diameter: 1/4"

Probe No.: 19

Maximum Depth: 1.0 m below surface

Type: Shovel

Diameter: 32 cm

Fill Description: Surface to 30 cm dry sand and gravel mixture. 30-60 cm moist sand with a minimal gravel content. 60-90 cm, possible FCR noted, not collected. 90-100 cm very moist sand with pebble content increasing.

Cultural Debris Recovered: None

Screen Diameter: 1/4"

Probe No.: 20

Maximum Depth: 43 cm below surface

Type: Shovel

Diameter: 30 cm

Fill Description: Surface to 43 cm, mottled mixture of brown, reddish brown and gray clayish, sandy silt, very moist. Encountered water table at 43 cm below surface.

Cultural Debris Recovered: None

Screen Diameter: 1/4"



Probe No.: 21

Maximum Depth: 65 cm below surface

Type: Shovel

Diameter: 32 cm

Fill Description: Sandy silt with roots from surface to 30 cm.  
After 30 cm below surface fill becomes more  
sandy, moist, with gravel concentrations.  
Gravel concentrations end abruptly at 52 cm.  
Water table encountered at 65 cm.

Cultural Debris Recovered: None

Screen Diameter: 1/4"

Probe No.: 22

Maximum Depth: 1.0 m below surface

Type: Shovel

Diameter: 30 cm

Fill Description: Surface to 74 cm, consisted of dry sand and  
pebble mixture. From 72-94 cm the sand and  
gravel were increasingly moist, very damp at  
1.0 m.

Cultural Debris Recovered: None

Screen Diameter: 1/4"

Probe No.: 23

Maximum Depth: 90 cm below surface

Type: Shovel

Diameter: 34 cm

Fill Description: Surface to 20 cm, a dry sand and gravel mixture, from 20-90 cm this mixture became increasingly moist.

Cultural Debris Recovered: None

Screen Diameter: 1/4"

Probe No.: 24

Maximum Depth: 76 cm below surface

Type: Shovel

Diameter: 33 cm

Fill Description: Surface to 53 cm fill was a homogenous, moist, sand. From 53-76 cm moisture and gravel content increased.

Cultural Debris Recovered: None

Screen Diameter: 1/4"

Probe No.: 25

Maximum Depth: 1.10 m below surface

Type: Shovel

Diameter: 32 cm

Fill Description: Surface to 68 cm fill consisted of dry sand and pebble mixture, which became damper to 1.10 m below surface.

Cultural Debris Recovered: None

Screen Diameter: 1/4"

Probe No.: 26

Maximum Depth: 86 cm below surface

Type: Shovel

Diameter: 30 cm

Fill Description: Surface to bottom at 86 cm, homogenous sandy silt, with few pebbles.

Cultural Debris Recovered: None

Screen Diameter: 1/4"

Probe No.: 27

Maximum Depth: 56 cm below surface

Type: Shovel

Diameter: 31 cm

Fill Description: Surface to 41 cm was a dark brown sandy silt, very damp with some pebbles and a small clay content. From 41-56 cm the fill became damper, lighter brown, and clay content increased.

Cultural Debris Recovered: None

Screen Diameter: 1/4"

Probe No.: 28

Maximum Depth: 1.03 m

Type: Shovel

Diameter: 32 cm

Fill Description: Surface to 55 cm, a fairly dry, sandy soil, with roots, pebbles and modern cultural debris. From 55-103 cm, sand became increasingly damp with gravel and a few roots.

Cultural Debris Recovered: None (other than modern garbage).

Screen Diameter: 1/4"

Probe No.: 29

Maximum Depth: 90 cm below surface

Type: Shovel

Diameter: 36 cm

Fill Description: Surface to 70 cm, fill was a dry sand and gravel mixture, with traces of charcoal. From 70-90 cm, a dry sand, gravel, pebble and cobble mixture.

Cultural Debris Recovered: None

Screen Diameter: 1/4"

Probe No.: 30

Maximum Depth: 48 cm below surface

Type: Shovel

Diameter: 33 cm

Fill Description: Surface to 30 cm, fill was a dry sand with pebbles, glass, and roots intermixed. From 30-45 cm cobbles increased in frequency as did gravels. At 48 cm below surface we encountered a thick cobble layer.

Cultural Debris Recovered: None

Screen Diameter: 1/4"

Probe No.: 31

Maximum Depth: 23 cm below surface

Type: Shovel

Diameter: 31 cm

Fill Description: Surface to 15 cm, a dry sand and gravel mixture, very disturbed, cobbles became increasingly thick to 23 cm below surface.

Cultural Debris Recovered: None

Screen Diameter: 1/4"

Probe No.: 32

Maximum Depth: 10 cm below surface

Type: Shovel

Diameter: 36 cm

Fill Description: Very disturbed and compacted gravel

Cultural Debris Recovered: None

Screen Diameter: 1/4"

Probe No.: 33

Maximum Depth: 1.20 m below surface

Type: Shovel and Auger

Diameter: 32 cm

Fill Description: From surface to 71 cm a dry sand with pebbles, shell, FCR, basalt and ccs flakes. From 71-120 cm sand became increasingly damp, shell fragments recovered down to a depth of 120 cm.

Cultural Debris Recovered: 2 basalt waste flakes  
1 ccs microflake  
1 fragment of Umbo shell  
20 fragments of unidentifiable shell

Screen Diameter: 1/4"

Probe No.: 34

Maximum Depth: 1.20 m below surface

Type: Shovel and Auger

Diameter: 36 cm

Fill Description: Surface to 50 cm, sand, very homogenous with a trace of shell. From 50-80 cm sand contained, shell and ccs flakes, as well as gravel and pebbles. From 80-110 cm moisture content increased, found a biface fragment, otherwise very similar to upper layer. From 110-120 cm moisture content increased, found a large basalt flake and a bone fragment.

Cultural Debris Recovered: 1 stemmed projectile point base  
2 utilized basalt flakes  
1 utilized ccs flake  
4 basalt waste flakes  
3 ccs flakes  
1 quartzite flake  
1 bird bone fragment  
4 fragments of Umbo shell

Screen Diameter: 1/8"

Probe No.: 35

Maximum Depth: 1.28 m below surface

Type: Shovel and Auger

Diameter: 36 cm

Fill Description: Surface to 14 cm, sand and pebble mixture, very loose and dry with 1 peach pit. From 14-46 cm, homogenous sand with shell fragments, pebbles, and a cobble chopper. From 46-110 cm we encountered damper sand containing, shell and basalt flakes. Mazama ash layer encountered from 110-116 cm below surface, devoid of cultural material. From 116-128 cm damp, homogenous sand with some volcanic ash.

Cultural Debris Recovered: 1 basalt chopper  
1 utilized basalt flake  
1 basalt waste flake  
1 bone fragment  
1 shell fragment recovered (many pieces were too small to collect)

Screen Diameter: 1/8"

Probe No.: 36

Maximum Depth: 1.15 m below surface

Type: Shovel

Diameter: 32 cm

Fill Description: Surface to 15 cm, sand, very dry. Recovered 1 quartzite cobble. From 15-72 cm homogenous sand, with small fragments of bone and shell. From 72-110 cm, a dry sand with fragments of shell and red ochre. Mazama ash layer encountered in 110-115 cm below surface, apparently devoid of cultural material.

Cultural Debris Recovered: 12 small fragments of bone  
2 pieces red ochre  
1 basalt microflake  
20 pieces of shell

Screen Diameter: 1/8"

Probe No.: 37

Maximum Depth: 1.28 m below surface

Type: Shovel

Diameter: 36 cm

Fill Description: Surface to 128 cm a homogenous, light gray sand with a few pebbles, no cultural material and no Mazama ash.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 38

Maximum Depth: 1.10 m below surface

Type: Shovel

Diameter: 36 cm

Fill Description: Surface to 84 cm, a dry homogenous, sand with a few pebbles, from 84 cm to 110 cm a dry sand, some traces of shell, no Mazama ash present.

Cultural Debris Recovered: None

Screen Diameter: 1/8"



Probe No.: 39

Maximum Depth: 1.25 m below surface

Type: Shovel and Auger

Diameter: 34 cm

Fill Description: Surface to 30 cm, a dry sand, very homogenous, with traces of shell bone, and 1 ccs flake. From 30-90 cm same sand with FCR, cobbles, basalt flake, ccs flakes, and bone, quite a lot of shell fragments. From 90-125 cm, sand still relatively dry with an abundance of shell fragments. Mazama ash layer was not encountered.

Cultural Debris Recovered: 1 edge ground basalt cobble fragment  
3 basalt waste flakes  
6 ccs flakes  
3 quartzite flakes  
30 shell fragments  
5 bone fragments

Screen Diameter: 1/8"

Probe No.: 40

Maximum Depth: 1.07 m below surface

Type: Shovel

Diameter: 36 cm

Fill Description: Surface to 55 cm, was dry sand, with some shell intermixed. From 55-95 cm, it was same, dry, homogenous sand, with some basalt flakes and shell. From 95-107 cm, same dry sand with a trace of shell.

Cultural Debris Recovered: 3 basalt waste flakes  
3 ccs waste flakes  
8 shell fragments  
1 piece of burned wood

Screen Diameter: 1/8"

Probe No.: 41

Maximum Depth: 1.11 m below surface

Type: Shovel and Auger

Diameter: 33 cm

Fill Description: Surface to 48 cm, dry sand, homogenous, with shell near surface. From 48 cm, dry sand became more compact and more moist down to 1.11 m below surface.

Cultural Debris Recovered: 1 edge battered and abraded basalt cobble fragment  
6 basalt waste flakes  
2 ccs flakes  
1 .30 cal. bullet slug  
25 shell fragments  
2 pieces of bone

Screen Diameter: 1/8"

Probe No.: 42

Maximum Depth: ?

Type: Shovel

Diameter: 34 cm

Fill Description: Surface to 86 cm, a relatively dry, homogenous sand, became more moist below 86 cm.

Cultural Debris Recovered: 1 basalt waste flake  
1 ccs waste microflake  
20 fragments of shell

Screen Diameter: 1/8"

Probe No.: 43

Maximum Depth: 1.20 m below surface

Type: Shovel

Diameter: 34 cm

Fill Description: Surface to 120 cm, dry, homogenous, fine grained sand which became damper from about 80 cm on down.

Cultural Debris Recovered: 1 worked basalt cobble fragment  
5 basalt waste flakes  
2 bone fragments  
150 shell fragments (predominantly Umbo)

Screen Diameter: 1/8"

Probe No.: 44

Maximum Depth: 1.20 m below surface

Type: Shovel

Diameter: 33 cm

Fill Description: Surface to 1.20 m fine-grained, dry, homogenous sand which gradually became damper. In upper 15 cm we encountered a concentration of FCR and shell.

Cultural Debris Recovered: 4 fragments FCR  
4 basalt flakes  
1 quartzite flake  
1 obsidian interior waste flake  
15 shell fragments

Screen Diameter: 1/8"

Probe No.: 45

Maximum Depth: 1.20 m below surface

Type: Shovel

Diameter: 32 cm

Fill Description: Surface to 1.20 m fine grained, dry, homogeneous sand which gradually became damper. In upper 15 cm we encountered a concentration of FCR and shell.

Cultural Debris Recovered: 3 fragments FCR  
1 fragment of shell

Screen Diameter: 1/8"

Probe No.: 46

Maximum Depth: 1.16 m below surface

Type: Shovel

Diameter: 32 cm

Fill Description: Surface to 1.20 m fine-grained, dry, homogeneous sand which gradually became damper. In upper 15 cm we encountered a concentration of FCR and shell.

Cultural Debris Recovered: 1 ccs scraper (distal fragment)  
3 basalt flakes  
2 Fire-cracked sand stone fragments  
1 shell fragment

Screen Diameter: 1/8"

Probe No.: 47

Maximum Depth: 1.90 m below surface

Type: Shovel and Auger

Diameter: 36 cm

Fill Description: This probe was excavated in an eroded section of road cut, and actually began at 93 cm below surface. From 93-142 cm below surface, homogenous, dry, fine-grained sand, with a small trace of tiny shell fragments. From 140-190 cm, sand became darker and more moist. Also in this bottom 50 cm we encountered a concentrated cultural layer containing the following materials.

Cultural Debris Recovered: 1 unifacial quartzite chopper  
1 bifacial basalt chopper  
1 utilized ccs uniface  
2 ccs waste flakes  
1 basalt hammer stone  
9 bone fragments  
40 shell fragments (predominantly  
Umbo)

Screen Diameter: 1/8"

Probe No.: 48

Maximum Depth: 1.20 m below surface

Type: Shovel and Auger

Diameter: 36 cm

Fill Description: Surface to 44 cm, a compact sandy silt with roots and shell near surface. From 44-74 cm sandy silt with gravel. From 74-120 cm fine grained, damp sand and this layer contained all of the following cultural material.

Cultural Debris Recovered: 3 basalt waste flakes  
2 ccs waste flakes  
1 quartzite waste flake  
2 bone fragments  
15 shell fragments

Screen Diameter: 1/8"

Probe No.: 49

Maximum Depth: 1.20 m below surface

Type: Shovel

Diameter: 32 cm

Fill Description: Surface to 20 cm a sandy silt with pebbles, roots, gravel, and a trace of shell. From 20-55 cm fill became sandier, and gravel increased. No shell. From 55-95 cm, fill was a homogenous sand with some gravel. From 95-120 cm sand became very damp and it was from this layer that most of the following cultural material came from.

Cultural Debris Recovered: 2 ccs waste flakes  
2 basalt waste flakes  
1 piece of charcoal  
2 pieces of burned bone  
25 shell fragments

Screen Diameter: 1/8"

Probe No.: 50

Maximum Depth: 90 cm below surface

Type: Shovel

Diameter: 33 cm

Fill Description: Sandy silt from surface to 30 cm, may be a loess deposit. From 30-64 cm, sand and gravel content increased. From 64-90 cm sand became damper, encountered a thick layer of river cobbles at 90 cm below surface.

Cultural Debris Recovered: 1 possible hammer stone (battered quartzite cobble)  
1 basalt waste flake  
1 Umbo shell fragment (large)

Screen Diameter: 1/8"

Probe No.: 51

Maximum Depth: 1.10 m below surface

Type: Shovel

Diameter: 34 cm

Fill Description: From surface to 38 cm below surface a coarse grained sandy silt with gravel, could be loess. From 38-45 cm fill becomes sandier and more compact. From 45-110 cm sand becomes damper, gravel content decreases.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 52

Maximum Depth: 1.32 m below surface

Type: Shovel and Auger

Diameter: 34 cm

Fill Description: From surface to 48 cm a coarse, compact, sandy silt with many root disturbances. Could be a loess deposit. From 48-132 cm a fine grained, homogenous sand, which became increasingly damp towards the bottom.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 53

Maximum Depth: 1.10 m below surface

Type: Shovel

Diameter: 34 cm

Fill Description: Surface to 70 cm, a coarse grained, compact, sandy silt with numerous pebbles. From 70-110 cm a silty sand, became sandier, fine grained, and damp.

Cultural Debris Recovered: 1 ccs microflake  
1 basalt microflake

Screen Diameter: 1/8"

Probe No.: 54

Maximum Depth: 1.12 m below surface

Type: Shovel

Diameter: 36 cm

Fill Description: Surface to 40 cm, a coarse grained, sandy silt with gravel intermixed. From 40-56 cm fill became sandier and finer grained. From 56-112, homogenous sand, became increasingly damp. Encountered a thick layer of river cobbles at 112 cm.

Cultural Debris Recovered: None

Screen Diameter: 1/8"



Probe No.: 55

Maximum Depth: 53 cm below surface

Type: Shovel

Diameter: 36 cm

Fill Description: From surface to 53 a very disturbed sandy silt with gravel in high frequencies. We halted digging at 53 because it was clear we were in old road fill.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 56

Maximum Depth: 1.15 m below surface

Type: Shovel

Diameter: 35 cm

Fill Description: Surface to 50 cm a sandy silt, with high amounts of gravel and root disturbances. From 50-108 cm very fine grained sand, homogeneous gray. From 108-115 very damp sand.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 57

Maximum Depth: 1.03 m below surface

Type: Shovel

Diameter: 32 cm

Fill Description: Sandy silt, disturbed with concrete, modern glass and roots, to a depth of 1 m.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 58

Maximum Depth: 1.13 m below surface

Type: Shovel

Diameter: 32 cm

Fill Description: Surface to 30 cm, compact, sandy silt. From 30-113 cm homogenous, fine grained sand, with scattered charcoal flecks.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 59

Maximum Depth: 1.10 m below surface

Type: Shovel

Diameter: 37 cm

Fill Description: Surface to 43 cm a sandy silt with gravel. From 43-110 cm, the usual homogenous sand.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 60

Maximum Depth: 72 cm below surface

Type: Shovel

Diameter: 34 cm

Fill Description: Surface to 50 cm, a sandy silt with pebbles and gravel intermixed. From 50-60 cm homogenous sand with prehistoric cultural debris (see below). From 60-70 cm damper sand. Encountered thick layer of river cobbles at 72 cm.

Cultural Debris Recovered: 2 ccs waste flakes (biface thinning flakes)

Screen Diameter: 1/8"

Probe No.: 61

Maximum Depth: 1.08 m below surface

Type: Shovel

Diameter: 36 cm

Fill Description: Surface to 50 cm sandy silt with high amounts of gravel and pebbles, and a trace of shell. From 50-108 cm the usual homogenous, fine grained, sand. From this layer we recovered the following cultural material.

Cultural Debris Recovered: 1 utilized ccs secondary cortex  
flake  
3 ccs micro waste flakes  
1 basalt waste flake  
1 bone fragment  
1 burned piece of shell

Screen Diameter: 1/8"

Probe No.: 62

Maximum Depth: 1.10 m below surface

Type: Shovel

Diameter: 37 cm

Fill Description: Surface to 43 cm a sandy silt, with moderate amounts gravel, roots, and a trace of charcoal. From 43-110 cm homogenous, fine grained sand with a faint trace of shell.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 63

Maximum Depth: 1.13 m below surface

Type: Shovel

Diameter: 34 cm

Fill Description: Surface to 40 cm, a sandy silt with a trace of shell. From 40-90 cm homogenous, fine grained sand with minimal pebble content. From 90-113 cm, sand becomes lighter colored and damper, possibly has a small amount of redeposited Mazama ash admixture.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 64

Maximum Depth: 1.13 m below surface

Type: Shovel

Diameter: 32 cm

Fill Description: Surface to 50 cm sandy silt with moderate amounts of gravel. From 50-113 cm homogenous sand.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 65

Maximum Depth: 1.10 m below surface

Type: Shovel

Diameter: 32 cm

Fill Description: Surface to 55 cm a coarse sandy silt with moderate amounts of gravel. From 55-110 cm homogenous, fine grained sand, became increasingly damp.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 66

Maximum Depth: 1.05 m below surface

Type: Shovel

Diameter: 33 cm

Fill Description: Surface to 36 cm, a coarse grained sandy silt with moderate amounts of gravel. From 36-105 cm, sand with occasional amounts of sandstone, and gravel.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 67

Maximum Depth: 82 cm below surface

Type: Shovel

Diameter: 33 cm

Fill Description: Surface to 60 cm silty sand, with moderate amounts of gravel. From 60-82 cm sand with minimal amounts of gravel, color became lighter, small amounts of volcanic ash at 82 cm.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 68

Maximum Depth: 1.15 m below surface

Type: Shovel

Diameter: 35 cm

Fill Description: Surface to 40 cm silty sand with moderate amounts of gravel. From 40-115 cm homogeneous sand with very few pebbles.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 69

Maximum Depth: 1.10 m below surface

Type: Shovel

Diameter: 32 cm

Fill Description: Surface to 30 cm silty sand with moderate amounts of gravel. From 30-110 cm homogeneous sand with few pebbles or gravel.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 70

Maximum Depth: 1.08 m below surface

Type: Shovel

Diameter: 36 cm

Fill Description: Surface to 50 cm, a silty sand with moderate amounts of gravel. From 50-108 cm homogeneous, fine grained, sand.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 71

Maximum Depth: 5 cm below surface

Type: Shovel

Diameter: 34 cm

Fill Description: Road fill, concentrated gravel and cobbles to a depth of 5 cm.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 72

Maximum Depth: 5 cm below surface

Type: Shovel

Diameter: 35 cm

Fill Description: Road fill, concentrated gravel and cobbles to a depth of 5 cm.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 73

Maximum Depth: 0 cm below surface

Type: Shovel

Diameter: 0 cm

Fill Description: Solid rock and compacted gravel on surface,  
looks like old road fill.

Cultural Debris Recovered: None

Screen Diameter: No screening.

Probe No.: 74

Maximum Depth: 93 cm below surface

Type: Shovel

Diameter: 32 cm

Fill Description: From surface to 93 cm, a silty sand with  
recent cultural debris and high amounts of  
gravel. Encountered boulders at 93 cm.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 75

Maximum Depth: 1.05 m below surface

Type: Shovel

Diameter: 34 cm

Fill Description: Surface to 105 cm, very disturbed sandy silt  
with moderate amounts of gravel.

Cultural Debris Recovered: No prehistoric materials, modern  
bottle glass was encountered.

Screen Diameter: 1/8"



Probe No.: 76

Maximum Depth: 1.10 m below surface

Type: Shovel

Diameter: 36 cm

Fill Description: Surface to 27 cm coarse grained sandy silt, with moderate amounts of gravel. From 27-110 cm homogenous sand.

Cultural Debris Recovered: 1 projectile point with missing stem, recovered at 27 cm below surface.

Screen Diameter: 1/8"

Probe No.: 77

Maximum Depth: 1.13 m below surface

Type: Shovel

Diameter: 33 cm

Fill Description: Surface to 1.13 m coarse grained sandy silt with moderate amounts of gravel, some evidence of asparagus beds at 46 cm below surface in this area.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 78

Maximum Depth: 1.14 m below surface

Type: Shovel

Diameter: 34 cm

Fill Description: Surface to 114 cm a homogenous, coarse grained, sandy silt with moderate amounts of gravel.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 79

Maximum Depth: 1.10 m below surface

Type: Shovel

Diameter: 32 cm

Fill Description: From surface to 40 cm silty sand with moderate amounts of gravel, very compact, probably from traffic to boat landing. From 40-110 cm homogenous, fine grained sand with few pebbles.

Cultural Debris Recovered: None

Screen Diameter: 1/8"

Probe No.: 80

Maximum Depth: 1.20 m below surface

Type: Shovel and Auger

Diameter: 36 cm

Fill Description: Surface to 40 cm, coarse grained sandy silt, resembled a plow zone. From 40-70 cm sandy silt became sandier, small amounts of gravel, and tiny traces of shell. From 70-120 homogenous sand with moderate to few amounts of gravel and pebbles.

Cultural Debris Recovered: 1 ccs micro waste flake  
1 fragment of bone

Screen Diameter: 1/8"

# APPENDIX 2 - SUMMARY DATA TABLES

## ARTIFACT TYPES BY LEVEL AND EXCAVATION UNIT

ARTIFACT TYPE	Level 1		Level 2		Level 3		Level 4		Level 5		Level 6		Level 7	
	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit
	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Utilized Flakes	0	0	0	3	1	0	0	0	0	0	0	1	0	0
Retouched Flakes	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Cobble Chop- pers (Biface)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cobble Chop- pers (Uniface)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Edge Ground Cobbles	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Projectile Points	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Projectile Point Frags.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scrapers	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Gravers	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Bifacial Knife Frags.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cores	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Debitage	2	0	4	11	8	3	3	0	4	2	2	2	10	4
Hammerstones	0	0	0	1	0	0	0	0	0	0	0	0	0	0
TOTAL	2	0	6	19	9	3	3	0	4	2	2	3	10	4

## ARTIFACT TYPES BY LEVEL AND EXCAVATION UNIT (CONT.)

ARTIFACT TYPE	Level 8		Level 9		Level 10		Level 11		Level 12		Level 13		Level 14	
	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2
Utilized Flakes	0	0	0	0	3	2	1	1	0	0	3	5	9	3
Retouched Flakes	0	0	0	0	0	0	0	0	0	0	1	1	2	0
Cobble Chop- pers (Biface)	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Cobble Chop- pers (Uniface)	0	0	0	0	0	0	0	0	0	0	0	3	1	0
Edge Ground Cobbles	0	0	0	0	0	0	0	0	0	0	0	2	0	1
Projectile Points	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Projectile Point Frags.	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Scrapers Bifacial	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Knife Frags.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cores	0	0	0	0	0	0	0	0	0	1	0	0	2	0
Hammerstones	0	0	0	0	0	0	0	0	0	0	2	2	1	0
Debitage	8	3	3	0	6	5	13	4	35	10	79	18	72	18
TOTAL	8	3	3	0	9	7	14	5	35	11	88	31	87	22

## ARTIFACT TYPES BY LEVEL AND EXCAVATION UNIT (CONT.)

ARTIFACT TYPE	Level 15		Level 16		Level 17		Level 18		Level 19	
	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2
UTILIZED										
Flakes	4	0	3		0		Devoid		Devoid	
Retouched Flakes	0	1	0		0		of		of	
Cobble Chop- pers (Biface)	0	0	0		0		Cultural		Cultural	
Cobble Chop- pers (Uniface)	0	0	0		0		Debris		Debris	
Edge Ground Cobbles	0	2	0		0					
Projectile Points	0	0	0		0					
Projectile Point Frags.	0	0	0		1					
Scrapers	0	1	0		0					
Bifacial Knife Frags.	0	0	0		0					
Cores	0	0	0		0					
Debitage	32	9	8		8					
TOTAL	36	13	11		9					

## LITHIC DEBITAGE

## Excavation Test Units

Level	Primary		Secondary		Interior		Shatter		Blades		Totals
	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	
	1	2	1	2	1	2	1	2	1	2	
1	0	0	1	0	1	0	0	0	0	0	2
2	0	0	1	2	3	9	0	0	0	0	15
3	3	1	1	0	4	2	0	0	0	0	11
4	0	0	0	0	0	0	3	0	0	0	3
5	0	1	0	0	2	1	2	0	0	0	6
6	0	0	1	0	0	2	1	0	0	0	4
7	0	0	0	0	7	1	3	3	0	0	14
8	0	0	0	0	3	3	5	0	0	0	11
9	0	0	0	0	1	0	2	0	0	0	3
10	1	1	0	1	5	3	0	0	0	0	11
11	2	1	1	1	5	2	5	0	0	0	17
12	3	2	2	1	24	8	7	0	0	0	47
13	2	6	5	5	46	13	27	0	0	0	104
14	5	2	11	3	50	15	6	4	0	0	96
15	1	2	3	3	24	9	4	0	0	0	46
16	0	1	0	2	0	5	0	0	0	0	8
17	0	1	0	1	0	6	0	0	0	0	8

TOTAL NUMBER OF FAUNAL ITEMS BY SIZE AND TYPE  
Excavation Test Units

Level	Large		Medium		Small		Micro		Fish		Bird		UD Other		Mussel Shell		Total
	Unit	1	Unit	2	Unit	1	Unit	2	Unit	1	Unit	2	Unit	1	Unit	2	
1	0	0	0	0	1	0	0	0	1	0	1	0	2	0	0	0	5
2	0	0	5	6	3	5	2	0	0	0	0	0	0	0	3	12	36
3	0	0	0	0	6	0	0	0	0	0	3	0	0	0	3	4	16
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
5	0	0	1	0	3	0	7	0	0	0	1	0	1	0	3	0	16
6	0	0	0	3	3	0	5	0	0	0	1	0	0	0	3	0	15
7	0	0	0	0	3	0	0	0	0	0	0	0	2	2	0	0	7
8	0	0	1	1	2	0	3	1	0	0	0	0	0	0	8	0	16
9	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	4
10	0	0	0	0	2	0	3	0	0	0	0	3	0	0	20	0	28
11	0	0	0	0	0	1	4	0	1	0	0	0	0	0	1	0	7
12	0	1	1	2	3	1	5	2	1	1	1	1	10	9	0	0	38
13	0	0	0	2	5	5	0	0	2	0	1	0	2	0	10	20	47
14	2	0	4	6	3	5	2	0	0	0	0	0	0	0	13	12	47
15	0	0	0	0	6	3	0	2	0	0	3	0	0	0	13	4	31
16	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	10
17	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	8	14

LITHIC CATEGORIES BY  
LEVEL AND EXCAVATION UNIT

Level	CCS		Basalt		Obsidian		Quartzite	
	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit
	1	2	1	2	1	2	1	2
1	1	0	1	0	0	0	0	0
2	2	4	2	10	0	0	2	5
3	1	0	5	0	0	0	3	0
4	2	0	1	0	0	0	0	0
5	3	0	1	2	0	0	0	0
6	1	3	1	0	0	0	0	0
7	8	4	2	0	0	0	0	0
8	7	3	1	0	0	0	0	0
9	2	0	1	0	0	0	0	0
10	5	2	2	4	0	0	1	0
11	10	2	2	3	0	0	1	0
12	22	7	13	4	0	0	1	0
13	68	2	14	13	0	0	2	5
14	50	14	32	8	0	0	4	3
15	21	6	14	6	1	0	1	1
16	0	2	0	5	0	0	0	1
17	0	6	0	2	0	0	0	0



# FIRE-CRACKED ROCK BY LEVEL AND EXCAVATION UNIT

Level	Count		Weight(g)	
	Unit	Unit	Unit	Unit
	1	2	1	2
2	2	4	18.5	744
3	2	0	2.4	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	4	0	27.5	0
14	18	0	14	0
15	3	0	104	0
16	0	0	0	0
17	0	0	0	0

END

FILMED

DT